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DEPARTMENT OF THE ARMY TECHNICAL MANUAL

DEPARTMENT OF THE AIR FORCE TECHNICAL ORDER

TM 11-253
TO 31R2-2SRC8-11

RADIO SETS AN/SRC-8 AN/SRC-8AZ AND AN/SRC-8XX

DEPARTMENTS OF THE ARMY AND THE AIR FORCE
MAY 1957

WARNING

DANGEROUS VOLTAGES EXIST IN THIS EQUIPMENT

Be careful when working around the antenna or the antenna terminals because high radio-frequency voltages exist at these points. Be careful not to contact high voltage connections to the power amplifier tube plates when adjusting the equipment. Turn off the power and discharge the high-voltage capacitors when making test connections or working inside the equipment. Be careful when working on the 220-volt plate and power supply circuits.

DON'T TAKE CHANCES

EXTREMELY DANGEROUS VOLTAGES EXIST IN THE FOLLOWING UNITS:

Radio Receiver-Transmitters

RT–306A/SRC–8 and RT–327A/SRC–8XX	650-volt circuits

Converter-Dynamotors

PU–283A/SRC–8 and CV–522/SRC–8	650-volt circuits

CAUTION

The high-voltage dynamotors are designed for intermittent duty. Do not transmit for longer than 5 minutes at a time.

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DEPARTMENTS OF THE ARMY AND
THE AIR FORCE
WASHINGTON 25, D. C., *8 May 1957*

RADIO SETS AN/SRC–8, AN/SRC–8AZ, AND AN/SRC–8XX

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CHAPTER 1

INTRODUCTION

Section I. GENERAL

1. Scope

a. This manual contains instructions for the installation, operation and maintenance of Radio Sets AN/SRC–8 (fig. 1), AN/SRC–8AZ, and AN–SRC–8XX.

b. Commanding officers and operating personnel should be familiar with applicable Federal Communication Commission (FCC) regulations and International Safety at Sea Convention procedures.

c. Forward comments on this publication directly to Commanding Officer, United States Army Signal Publications Agency, Fort Monmouth, N. J.

2. Forms and Records

a. Unsatisfactory Equipment Reports. Fill out

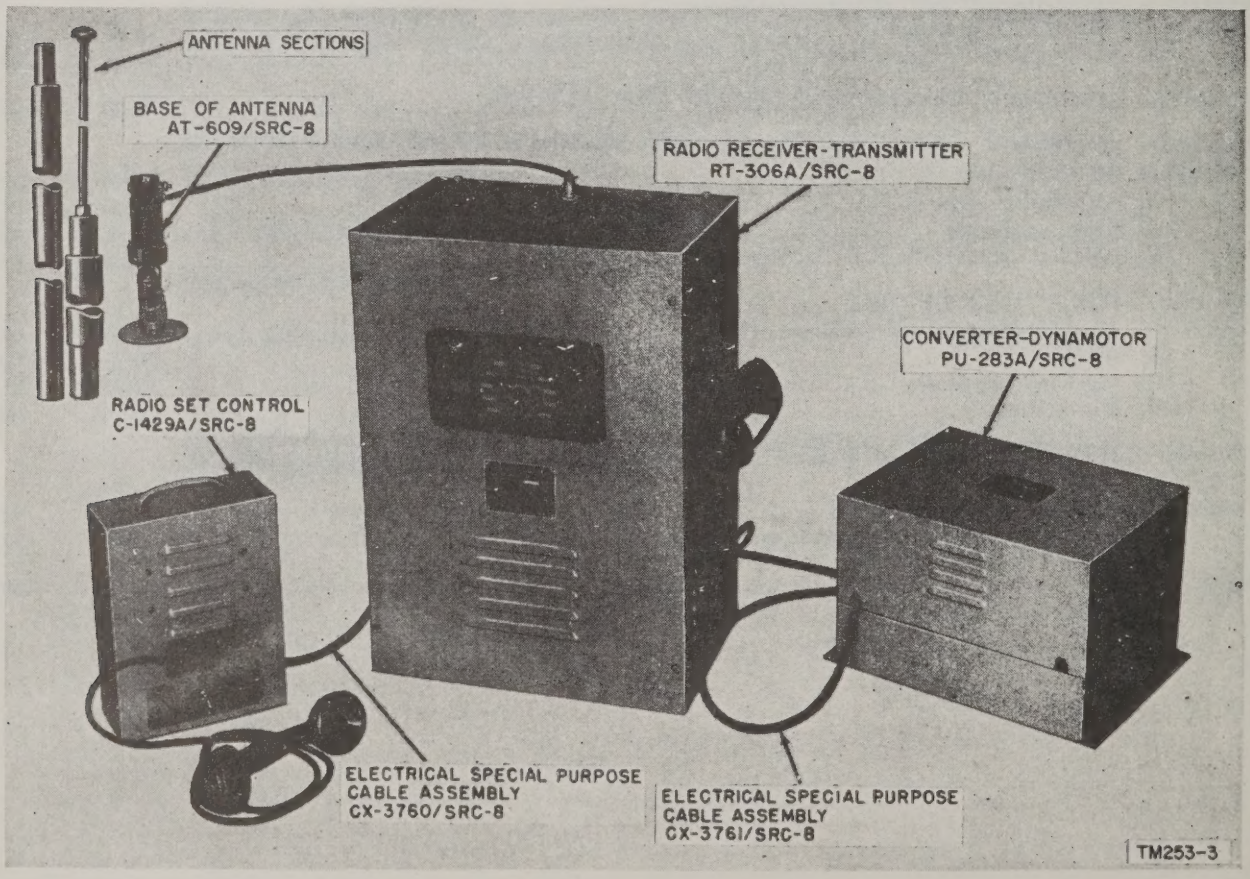

Figure 1. Radio Set AN/SRC–8 with auxiliary remote control and Antenna AT–609/SRC–8.

and forward DA Form 468 (Unsatisfactory Equipment Report) to Commanding Officer, U. S. Army Signal Equipment Support Agency, Fort Monmouth, N. J., as prescribed in AR 700–38.

b. Damaged or Improper Shipment. Fill out and forward DD Form 6 (Report of Damaged or Improper Shipment) as prescribed in AR 700–58 (Army).

c. Preventive Maintenance Forms.

(1) Prepare DA Form 11–238, Operator First Echelon Maintenance Check List for Signal Corps Equipment (Radio Communication, Direction Finding, Carrier, Radar) (fig. 10) in accordance with instructions on the back of the form.

(2) Prepare DA Form 11–239 (Second and Third Echelon Maintenance Check List for Signal Corps Equipment (Radio Communication, Direction Finding, Carrier, Radar)) (fig. 11), in accordance with instructions on the back of the form.

Section II. DESCRIPTION AND DATA

3. Purpose and Use

a. Radio Sets AN/SRC–8, AN/SRC–8AZ, and AN/SRC–8XX provide amplitude-modulated (am.) radiotelephone ship-to-shore and ship-to-ship communication between coastal, harbor, and river vessels and short stations. They operate within the frequency range of 2.0 to 3.5 megacycles (mc). Radio Set AN/SRC–8 is used on ships or at shore stations where a 115-volt direct current (dc) source is available; Radio Set AN/SRC–8XX is used where the power source is 12 volts dc, and Radio Set AN/SRC–8AZ is used where the power source is 24 volts dc.

b. Ten preset crystal-controlled channels selected for the area of operations are available.

4. Technical Characteristics

a. Receiver Section.

Receiver type	Superheterodyne.
Number of tubes	7.
Frequency range	10 preset channels within the range of 2.0 to 3.5 mc.
Frequency control	Crystal-controlled.
Type of signals received	Am. (A–3).
Sensitivity	10 microvolts for 20-decibel signal plus noise-to-noise ratio.
Intermediate frequency	456 kilocycles.
Bandwidth	5.5 kc (6 db down), 28 kc (60 db down).
Maximum audio output	2 watts (1 watt at 10% distortion).

b. Transmitter Section.

Transmitter type	Crystal-controlled oscillator, untuned buffer, modulated power amplifier.
Number of tubes	6.
Frequency range	10 preset channels within the range of 2.0 to 3.5 mc.
Type of modulation	Voice-amplitude modulation.
Distance range	50 to 200 miles.
Power output	50 watts, carrier.

c. Converter-Dynamotor.

	PU–283A/SRC–8 (part of radio Set AN/SRC–8)	*CV–522/SRC–8 (part of Radio Set AN/SRC–8AZ)*
(1) *Inverter.*		
Frame	GY–29.	GY–29.
Input	115 volts dc, 1.6 amperes.	24 volts dc, 7.5 amperes.
Output	115 volts ac, .87 amperes.	115 volts ac, .87 amperes.
Temperature rise	40°C.	40° C.
Speed (continuous duty)	3,600 rpm.	3,600 rpm.
Power factor	1.00.	1.00.
Fuse protection (inverter output)	2-ampere slow-blow.	2-ampere slow-blow.
(2) *Dynamotor.*		
Frame	GY–25.	GY–25.
Input	115 vdc, 2.5 amperes.	24 vdc, 12 amperes.
Output	650 vdc, .3 amperes.	650 vdc, .3 amperes.
Temperature rise	50° C.	50° C.
Speed	6,600 rpm.	6,600 rpm.
Duty cycle (max.)	5 minutes on. 15 minutes off.	5 minutes on. 15 minutes off.
(3) *Magnetic controls.*		
Relay (continuous duty)	Double-pole, single-throw; single coil.	Double-pole, single-throw; single coil.
Relay (intermittent duty)	Triple-pole, single-throw; double coil.	Triple-pole, single-throw; double coil.

d. Integral Power Supply Components of Radio Set AN/SRC–8XX.

(1) *Dynamotor DY–126A/SRC–8XX.*

Frame——GY–12.
Input——12 volts dc, 3.5 amperes.
Output——250 volts dc, .08 amperes.
Temperature rise——40° C.
Speed (continuous duty)——4,200 rpm.
Power factor——1.00.

(2) *Dynamotor DY–127A/SRC–8XX.*

Frame——GY–25.
Input——12 volts dc, 24 amperes.
Output——650 volts dc, .3 amperes.
Temperature rise——55° C.
Speed (intermittent duty)——6,000 rpm.
Power factor——1.00.

(3) *Magnetic controls.*

Relay (continuous duty)——Double-pole, single-throw.
Relay (intermittent duty)——Triple-pole, single-throw.

5. Components of Radio Sets AN/SRC–8, AN/SRC–8AZ, and AN/SRC–8XX

a. Components.

Item	Radio Set AN/SRC–8	Radio Set AN/SRC–8AZ	Radio Set AN/SRC–8XX	Height (in.)	Depth (in.)	Width (in.)	Volume (cu ft)	Unit weight (lb)
Radio Receiver-Transmitter RT–306A/SRC–8.	1	1		23	10¼	18½	2.5	63
Radio Receiver-Transmitter RT–327A/SRC–8XX.			1	23	10¼	18½	2.5	68
Converter-Dynamotor PU–283A/SRC–8.	1			8½	10¾	14⅜	.8	31
Converter-Dynamotor CV–522/SRC–8.		1		8½	10¾	14⅜	.8	31
Electrical Special Purpose Cable Assembly CX–3761/SRC–8.	1	1				Length 144		
Manual.	2	2	2	10¼		7⅞		.25
Running spares (*b* below).	1 set	1 set	1 set					3

b. Running Spares.

Item	Radio Set AN/SRC–8	Radio Set AN/SRC–8XX	Radio Set AN/SRC–8AZ
Tube 6SK7	1	1	1
Tube 6K8	1	1	1
Tube 6K7	1	1	1
Tube 6V6GT	1	1	1
Tube 6SL7GT	1	1	1
Tube 6H6	1	1	1
Tube 6B8	1	1	1
Tube 6J5	1	1	1
Tube 5Y3GT	1	—	1
Tube 807	2	2	2
Lamp, type 57	1	1	1
Antenna post	1	1	1
Carbon brush #12227–1	1	2	1
Carbon brush #12227–2	1	2	1
Carbon brush #12235–1	2	—	—
Carbon brush #12235–2	2	—	—
Carbon brush #12236–1	1	—	1
Carbon brush #12236–2	1	—	1
Fuse, 2-ampere, type 3AG, Slo-Blo.	6	—	—
Carbon brush #12230–1	—	1	—
Carbon brush #12230–2	—	1	—
Carbon brush #12718–1	—	1	—
Carbon brush #12718–2	—	1	—
Carbon brush #22069–1	—	—	2
Carbon brush #22069–2	—	—	2
Power cable	1	—	—

6. Nomenclature and Common Names

Nomenclature and common names of Radio Sets AN/SRC–8, AN/SRC–8AZ, and AN/SRC–8XX, its components and additional auxiliary equipment follows:

Nomenclature	Common name
Radio Sets AN/SRC–8, AN/SRC–8AZ, or AN/SRC–8XX.	Radio Set
Radio Receiver-Transmitter RT–306A/SRC–8	Receiver-transmitter
or	
Radio Receiver-Transmitter RT–327A/SRC–8XX.	
Converter-Dynamotor PU–283A/SRC–8	Converter-dynamotor
or	
Converter-Dynamotor CV–522/SRC–8.	
Electrical Special Purpose Cable Assembly CX–3761/SRC–8.	Power cable
Antenna AT–609/SRC–8.[b]	Antenna
Radio Set Control C–1429A/SRC–8.[a]	Remote control
Electrical Special Purpose Cable Assembly CX–3760/SRC–8.[a]	Remote control cable

[a] Auxiliary equipment used with, but not a part of, the radio sets.
[b] Additional equipment required.

7. Description

a. Receiver-Transmitter. The receiver-transmitter components are mounted on a chassis shock-

mounted within a case. The case has holes at the rear and bottom to provide for either bulkhead or shelf mounting. There is a piano-type hinge at the bottom front of the receiver-transmitter. Release of the two captive screws at the top rear allows the entire chassis and case to swing down. All controls are mounted on the recessed front panel. The handset is mounted on a bracket at the right side. Connections are made at the rear of the chassis, and the connecting cables are fed through holes in the rear or bottom of the case. The antenna post is mounted at the top of the case.

b. Converter-Dynamotor. The base of the converter-dynamotor is flanged at two ends only and there are two mounting holes in each flange. The dynamotor, inverter, fuse holder, and terminal blocks for power and connecting cables are mounted on the chassis top and are accessible when the cover is removed (fig. 2). Two cutouts in the cover provide entrance for the battery cable and the 12-foot power cable to the receiver-transmitter.

8. Additional Equipment Required

Antenna AT–609/SRC–8 is used with, but is not a part of, the radio set. It is a vertical, quarter-wave, center-loaded antenna, and it is self-resonant at frequencies between 2 and 3 mc. The antenna includes the mounting hardware necessary for shipboard installation.

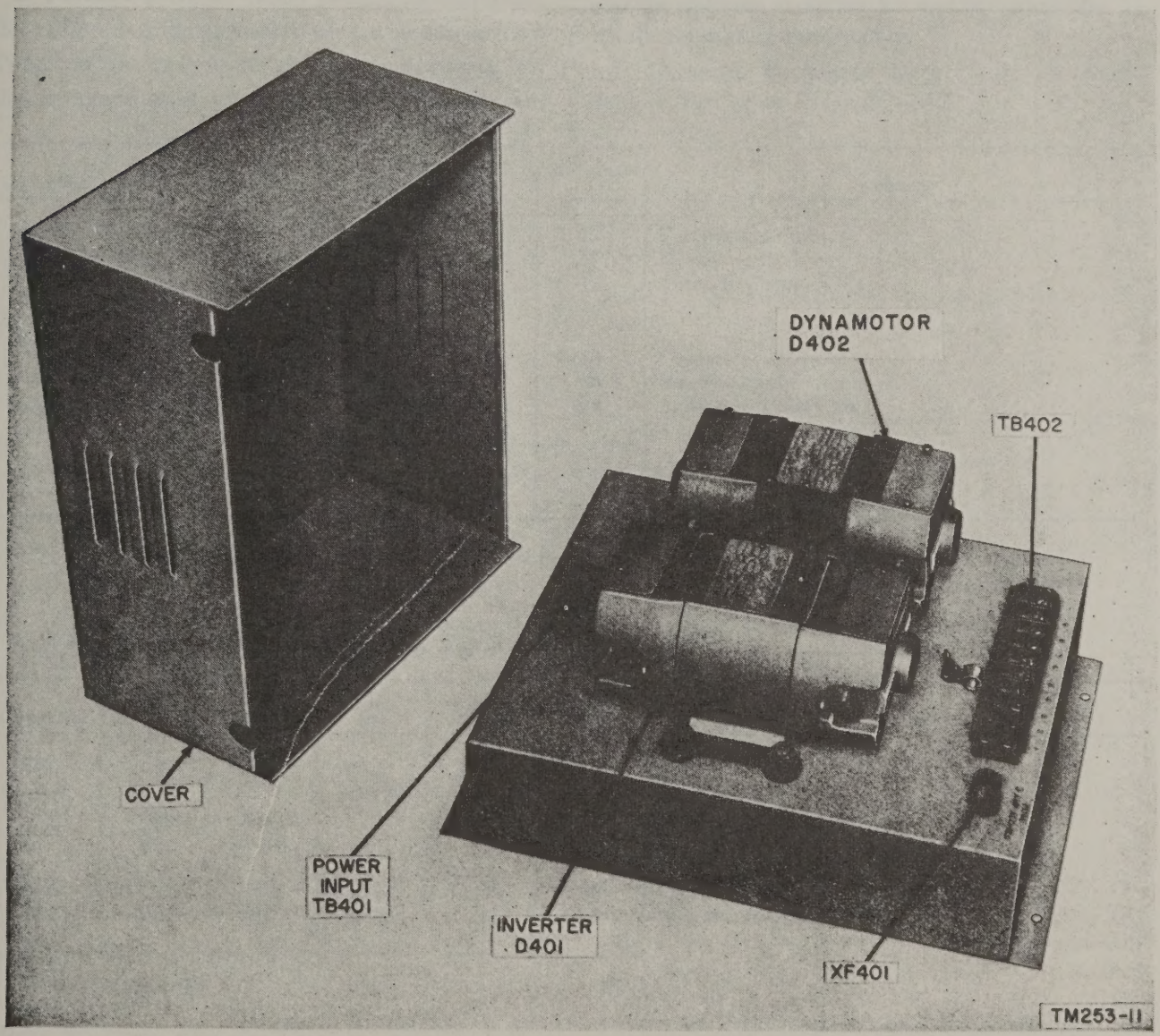

Figure 2. Converter-dynamotor, cover removed.

9. Differences in Radio Sets

The receiver and transmitter sections of the various radio sets are identical, except for different filament connections in Radio Set AN/SRC–8XX. The major differences are in the power supplies. All sets are operated from dc and each employs a dynamotor to convert the low dc source voltage to 650 volts dc for the modulator and power amplifier (pa) stages. An additional dynamotor is used in Radio Set AN/SRC–8XX to convert the 12-volt dc input to 250 volts dc for the receiver stages and for the oscillator and buffer stages of the transmitter section. In the other two radio sets, an inverter converts the dc input to 115 volts ac, and this ac is supplied to a conventional full-wave power supply for the receiver and oscillator and buffer stages. The two dynamotors are mounted within Radio Receiver-Transmitter RT–327A/SRC–8XX (part of Radio Set AN/SRC–8XX) and the dynamotor and inverter for each of the other sets are in a separate component (converter-dynamotor fig. 2).

CHAPTER 2

INSTALLATION

Section I. SERVICE UPON RECEIPT OF EQUIPMENT

10. Unpacking

a. Packaging Data. When packed for shipment, the radio set components are placed in six cartons. These cartons include the antenna components and the remote control which are used with, but are not a part of, the radio set. For export shipment, two wooden boxes are used. One is for the antenna and the antenna assembly kit and the other (fig. 3) for the remaining components.

b. Domestic Packaging Data Chart for Radio Set AN/SRC–8 or AN/SRC–8AZ.

Carton No.	Height (in.)	Width (in.)	Depth (in.)	Volume (cu ft)	Unit weight (lb)	Contents
1 of 6	25¼	19⅞	13	4	72	Receiver-transmitter
2 of 6*	13⅛	12	9–1/9	.8	11	Remote control
3 of 6*	14 feet, 5⅝ in. lg	2¾ dia		.5	16	Antenna w/spare whip
4 of 6	12½	17	13⅝	2	40	Converter-dynamotor
5 of 6	12¼	7 15/16	6½	.35	5	Running spares
6 of 6*	5⅜	6¾	4 11/16	.1	4	Antenna assembly kit
Total weight (lb)					148	

* Used with, but not a part of, Radio Set AN/SRC–8 or AN/SRC–8AZ.

c. Domestic Packaging Data Chart for Radio Sets AN/SRC–8XX.

Carton No.	Height (in.)	Width (in.)	Depth (in.)	Volume (cu ft)	Unit weight (lb)	Contents
1 of 5	25¼	19⅞	13	4	77	Receiver-transmitter
2 of 5*	13⅛	12	9–1/9	.8	11	Remote control
3 of 5*	14 feet, 5⅝ in. lg	2¾ in. dia		.5	16	Antenna w/spare whip
4 of 5	12¼	7 15/16	6½	.35	5	Running spares
5 of 5*	5⅜	6¾	4 11/16	.1	4	Antenna assembly kit
Total weight (lb)					113	

* Used with, but not a part of, Radio Set AN/SRC–8XX.

d. Export Packaging Chart for Radio Set AN/SRC–8 or AN/SRC–8AZ.

Box No.	Height (in.)	Width (in.)	Depth (in.)	Volume (cu ft)	Unit weight (lb)	Contents
1/2	28	22	26	9.26	145	Radio set, power supply, remote control, technical manuals, and running spares.
2/2	6	6	150	3.1	30	Antenna and antenna assembly kit.
Total weight (lb)					175	

Note. The remote control, antenna, and antenna assembly kit are used with, but not a part of, Radio Set AN/SRC–8 or AN/SRC–8AZ.

e. Export Packaging Chart for Radio Set AN/SRC–8XX.

Box No.	Height (in.)	Width (in.)	Depth (in.)	Volume (cu ft)	Unit weight (lb)	Contents
1/2	22	22	28	7.8	110	Radio set, remote control, technical manuals, and running spares.
2/2	6	6	150	3.1	30	Antenna and antenna assembly kit.
Total weight (lb)					140	

Note. The remote control, antenna, and antenna assembly kit are used with, but not part of, Radio Set AN/SRC–8XX.

f. Removing Contents. Perform (1) through (4) below when removing equipment from the wooden cases.

(1) Cut and fold back the metal straps.

(2) Remove the nails from the top and one side of the case with a nail puller. Remove the top and side. Do not attempt to pry off the top and side.

(3) Open the outer corrugated carton. Remove the individual cartons.

(4) Open the individual cartons and remove their contents.

11. Checking Unpacked Equipment

a. Inspect the equipment for damage incurred during shipment.

b. Check to see that the equipment is complete as listed on the packing list or in the table of components (par. 5). In the check list, include items which are used with, but are not components of, the radio set. Be sure that all tubes in the receiver-transmitter are seated firmly in their proper sockets (figs. 5 and 6). Loosen the fuse holder cap in the converter-dynamotor (part of Radio Set AN/SRC–8 or AN/SRC–8AZ only) and check to see that it has the proper amperage rating (2 amperes).

Caution: To avoid damage to inverter D401, do not use any fuse other than specified.

c. If the equipment is incomplete or has been damaged during shipment, refer to paragraph 2*b*.

d. If the equipment has been used or reconditioned, check to see if it has been changed by a modification work order (MWO). If modified, the MWO number will appear on the front panel near the nomenclature plate. Indicate the MWO number on the applicable main schematic and wiring diagrams (figs. 41–44).

12. Siting.

The location of marine radio sets depends on the assigned area of navigation of the individual vessel and local harbor and coastal conditions. Weak or otherwise undesirable signals may be expected if a set is operated near cliffs or near work vessels or harbor installations using power equipment. Closeness to other transmitting vessels may introduce hum and noise interference in the receiving antenna. Operation under traffic-carrying or steel bridges is difficult because of local electrical interference and high absorption of radio frequency

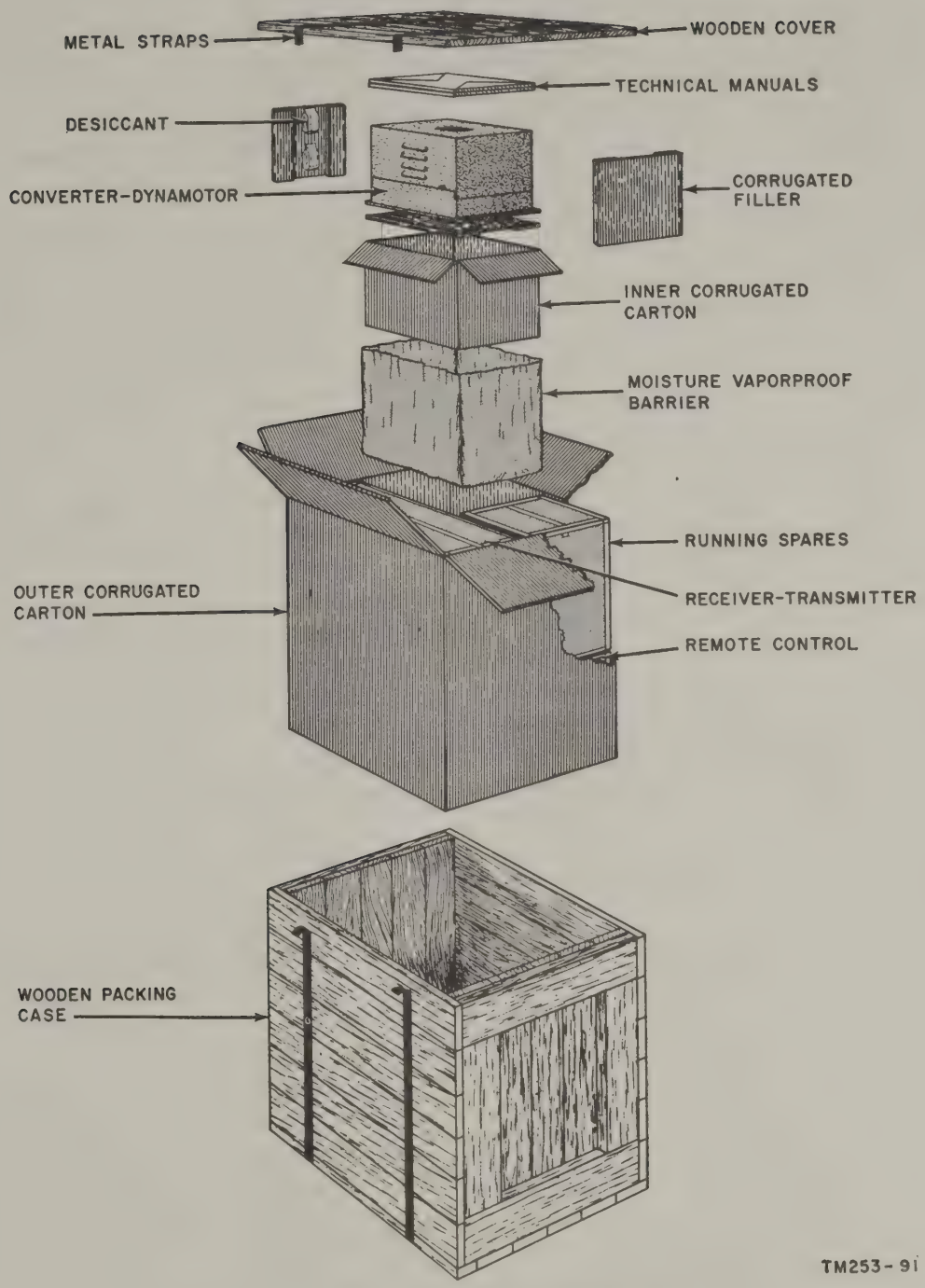

Figure 8. Packaging diagram.

(RF) waves. Lowering of the antenna is required when the vessel passes under a low bridge.

13. Shelter Requirements

The best location for shipboard installation of the radio set varies with the type, construction, and physical layout of the using vessel. Refer to figure 4 for size and mounting dimensions of all components. Consideration should be given the following housing recommendations. Refer to paragraph 14 for installation and connection instructions.

a. The receiver-transmitter should be located in the wheelhouse. Make controls accessible to the pilot-operator, provide protection from weather ele-

ments and driven spray, avoid strong vibration areas and allow sufficient space to gain access for operation and servicing. Try to keep the receiver-transmitter and antenna as close to each other as possible. The combined length of the antenna lead-in and the ground lead should not exceed 20 feet.

b. The converter-dynamotor (Radio Sets AN/SRC–8 and AN/SRC–8AZ only) should be located in a dry locker or convenient and safe position in the engine room. Mount it on a suitable foundation and use rubber blocks, if available, to lessen the vibration. Provide at least 6 inches of space between the sides of the converter-dynamotor that have the ventilating louvers on them and any bulkhead or obstruction. Provide at least 1 foot of space on the opposite sides to allow for access to the cover mounting screws. The unit should be kept away from heated objects such as engine exhausts, steam pipes, and boilers. The free air space around the unit should be not less than 27 cubic feet.

Caution: The dynamotor, inverter, and power relays (component parts of the converter-dynamotor) are of open frame type construction and can be affected by the various fumes found aboard ship. Salt-ladened air or the acid vapors that come from wet cell batteries cause corrosion. Gasoline and other inflammable fumes *must* be avoided because of sparking at the commutators and slip rings of the rotating electrical components.

c. Antenna AT–609/SRC–8, while not a part of the radio set, is typical of the marine antenna required. It is usually mounted adjacent to the outside bulkhead of the wheelhouse. The mast requires only a few inches of deck space for mounting but must have rigid support at least 4 feet from the base. A holding latch block provides this support and can be released to permit lowering the mast which can turn on the swivel base. Provide deck space for lowering. An antenna rest is supplied as part of the antenna. When the antenna is lowered, this rest should cradle the mast and hold it up off the deck.

14. Installation and Connections

The installation of the radio set includes positioning as recommended in paragraph 13 for each unit; fastening of each unit to bulkhead, shelf top, or deck as required; installation of crystals; and stowage of running spares.

Caution: Locate the ship's service line that is to supply power for the radio set. Test the service line terminals with a voltmeter to check for correct voltage and polarity. Open the safety switch or remove the fuses in the power line. Tag the switch DO NOT TOUCH or DO NOT CLOSE to prevent closing by other personnel.

a. Receiver-Transmitter.

(1) Remove the two knurled screws at the top rear of the cabinet and pull the top front forward. The front panel and entire chassis swings forward and downward.

(2) Four mounting holes are now accessible in the rear panel and the four mounting holes in the bottom are also exposed.

(3) See figure 4. Use either the rear or bottom view to determine the location of the mounting screws. If possible, use both mounting surfaces.

(4) For rear-panel mounting on wooden bulkheads, use No. 14 roundhead wood screws at least 1¼ inches long. Set the screws in to within ¼ inch of their full length. Suspend the receiver-transmitter on the screws and tighten. Rear-panel mounting on metal bulkheads requires drilling and use of ¼- to ½-inch mounting bolts.

(5) For bottom mounting, use No. 14 roundhead wood screws at least 1 inch long.

(6) Insert the crystals into the proper socket. The number stamped at each crystal socket (figs. 5 and 6) corresponds to the positions of the channel selector switch numbered clockwise from 1 to 10. The transmitting crystals are marked with actual channel transmitting frequency. The lowest frequency channel to be used should be assigned to the No. 1 position and the other channels should be assigned in order of frequency. The receiving crystals are marked with a frequency 456 kilocycles (kc) higher than the receiving channel frequency (e.g. to receive a 2,600-kc signal, a 3,056-kc crystal must be used). A channel may consist of one transmitting frequency and the same or different receiving frequency. Write the transmitting frequency in the box next to each switch position.

(7) For Radio Receiver-Transmitter RT–306A/SRC–8 (part of Radio Sets AN/

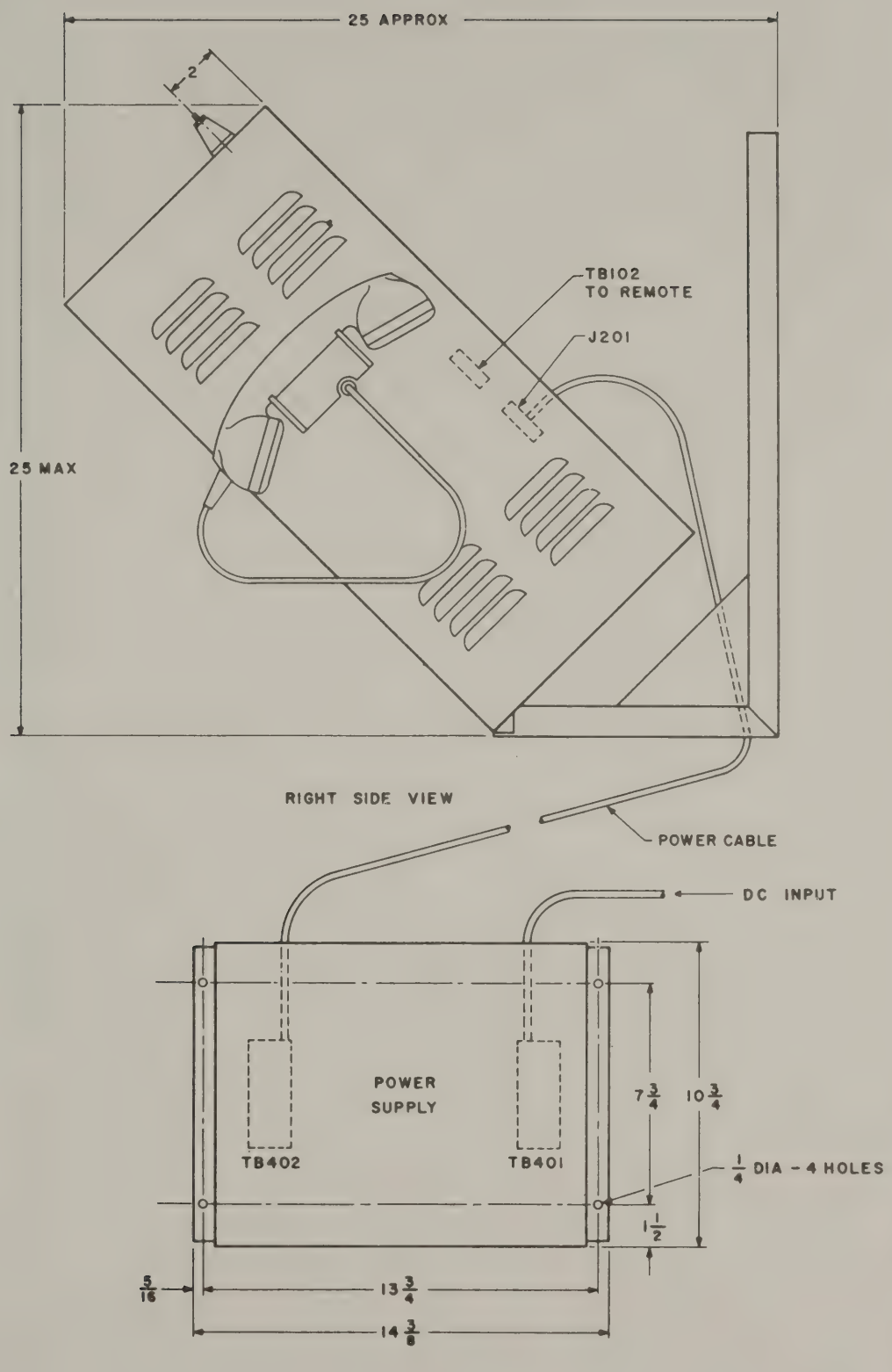

Figure 4. Receiver-transmitter and converte

ments and driven spray, avoid strong vibration areas and allow sufficient space to gain access for operation and servicing. Try to keep the receiver-transmitter and antenna as close to each other as possible. The combined length of the antenna lead-in and the ground lead should not exceed 20 feet.

b. The converter-dynamotor (Radio Sets AN/SRC–8 and AN/SRC–8AZ only) should be located in a dry locker or convenient and safe position in the engine room. Mount it on a suitable foundation and use rubber blocks, if available, to lessen the vibration. Provide at least 6 inches of space between the sides of the converter-dynamotor that have the ventilating louvers on them and any bulkhead or obstruction. Provide at least 1 foot of space on the opposite sides to allow for access to the cover mounting screws. The unit should be kept away from heated objects such as engine exhausts, steam pipes, and boilers. The free air space around the unit should be not less than 27 cubic feet.

Caution: The dynamotor, inverter, and power relays (component parts of the converter-dynamotor) are of open frame type construction and can be affected by the various fumes found aboard ship. Salt-ladened air or the acid vapors that come from wet cell batteries cause corrosion. Gasoline and other inflammable fumes *must* be avoided because of sparking at the commutators and slip rings of the rotating electrical components.

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(3) See figure 4. Use either the rear or bottom view to determine the location of the mounting screws. If possible, use both mounting surfaces.

(4) For rear-panel mounting on wooden bulkheads, use No. 14 roundhead wood screws at least 1¼ inches long. Set the screws in to within ¼ inch of their full length. Suspend the receiver-transmitter on the screws and tighten. Rear-panel mounting on metal bulkheads requires drilling and use of ¼- to ½-inch mounting bolts.

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(7) For Radio Receiver-Transmitter RT–306A/SRC–8 (part of Radio Sets AN/

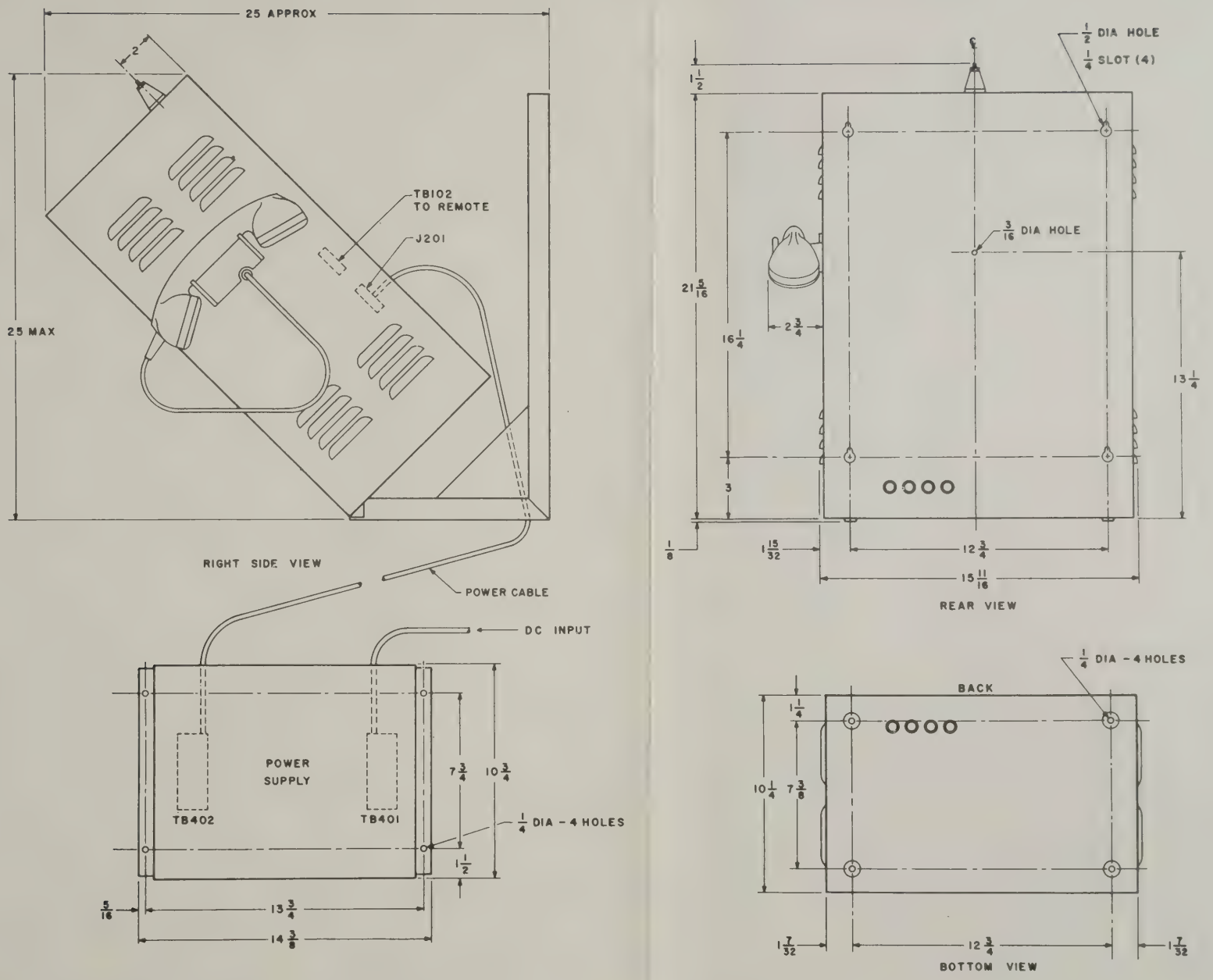
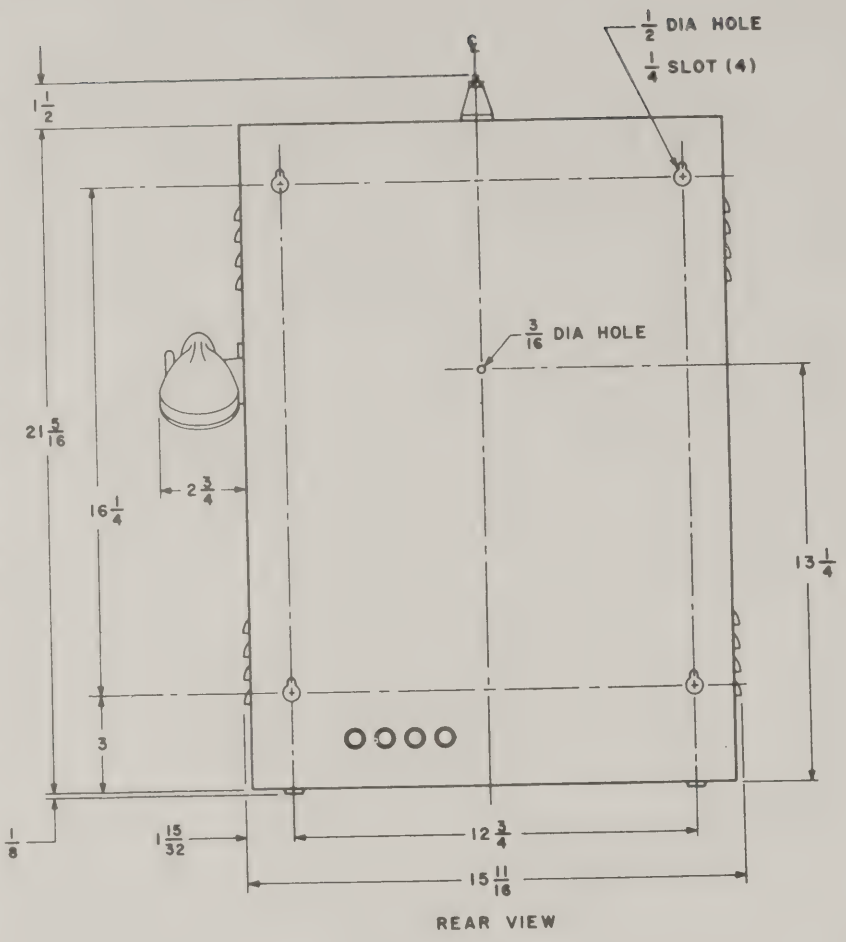


Figure 4. Receiver-transmitter and converter-dynamotor, installation diagram.

TM253-13



Ca-dynamotor, installation diagram. TM253-13

SRC–8 and AN/SRC–8AZ), proceed as follows:

(*a*) Plug the power cable into jack J201 (fig. 5) at the lower rear of the chassis. Pass the free end of the cable through any convenient access hole at either the rear or bottom of the cabinet.

Note. Where both rear and bottom mountings are used, drill a hole through the shelf to allow this cable to pass through.

(*b*) Clamp the interconnecting cable to the bulkhead or table top with a ⅜-inch inside diameter clamp. Leave sufficient slack in the cable to allow for opening the receiver-transmitter and allowing the cabinet to swing downward.

(*c*) Run the interconnecting cable to the converter-dynamotor as directly as possible (in accordance with shipboard practice), keeping it away from heated objects. At 18-inch intervals, the cable should be securely clamped.

(*d*) Use any convenient access hole in either the back or bottom of the cabinet and pass the ground lead (No. 8 or thicker wire) through the hole and attach it to the receiver-transmitter chassis. Connect the lead to the ground system as discussed in *d* below.

(*e*) Close the cabinet and fasten it securely at the top rear with the knurled screws.

(8) For Radio Receiver-Transmitter RT–327A/SRC–8XX (part of Radio Set AN/SRC–8XX), pass the free end of the heavy power cables through the selected hole in either the rear or bottom panel. Refer to the note in (7) (*a*) above. Connect to the ground system as discussed in *d* below. Be sure to allow enough slack in the cables to permit opening the receiver-transmitter and allowing the chassis to swing completely down. Close the cabinet and fasten it securely at the top rear with the knurled screws.

b. Converter-Dynamotor (Radio Sets AN/SRC–8 or AN/SRC–8AZ Only).

(1) Two mounting holes are provided at each of the two flanged ends of the base plate (fig. 4). Using screws, fasten the converter-dynamotor securely to the deck or nonmovable stand. Allow clearance at each end of the power supply for access to the cover mounting screws.

(2) Remove the cover by unscrewing the three screws at each end of the supply.

(3) Connect the power cable from the receiver-transmitter to nine-terminal connecting strip TB402 (fig. 2). The terminals and cable ends are numbered for proper identification. Clamp the cable to the power supply; use the cable clamp supplied.

(4) Connect the input power lines to the two-terminal connecting block (TB401) located at the opposite end of the chassis. Observe polarity. There are no power line fuses in the converter-dynamotor. These fuses and a power line switch should be located within reach of the converter-dynamotor. The switch should be a double-pole, single-throw switch with a rating of 125 volts at 30 amperes. Both power lines should be fused. A 5-ampere, 125-volt, time lag fuse should be used with Converter-Dynamotor PU–283A/SRC–8. With Converter-Dynamotor CV–522/SRC–8, a 30-ampere, 32-volt, time lag fuse should be used.

(5) The following table indicates minimum power line wire size for various distances between the power source and the converter-dynamotor.

Wire length (ft)	Wire size	
	PU–283A/SRC–8	CV–522/SRC–8
Less than 5		No. 8 AWG
More than 5 but less than 10		No. 6 AWG
More than 10 but less than 20	No. 12 AWG	No. 4 AWG
More than 20 but less than 50	No. 10 AWG	See note
More than 50	No. 8 AWG	

Note. Where the wire length from Converter-Dynamotor CV–522/SRC–8 is greater than 20 feet, a separate battery power source should be located as near the converter-dynamotor installation as possible. The minimum ampere-hour rating of the power source should be 100 ampere-hours. Charging lines should be run from the ship's generator to the separate power source.

(6) The cover may be mounted on the chassis to allow the cables to enter from either side. Replace the cover.

c. Antenna. Locate the antenna as near the receiver-transmitter as possible, keeping it clear of

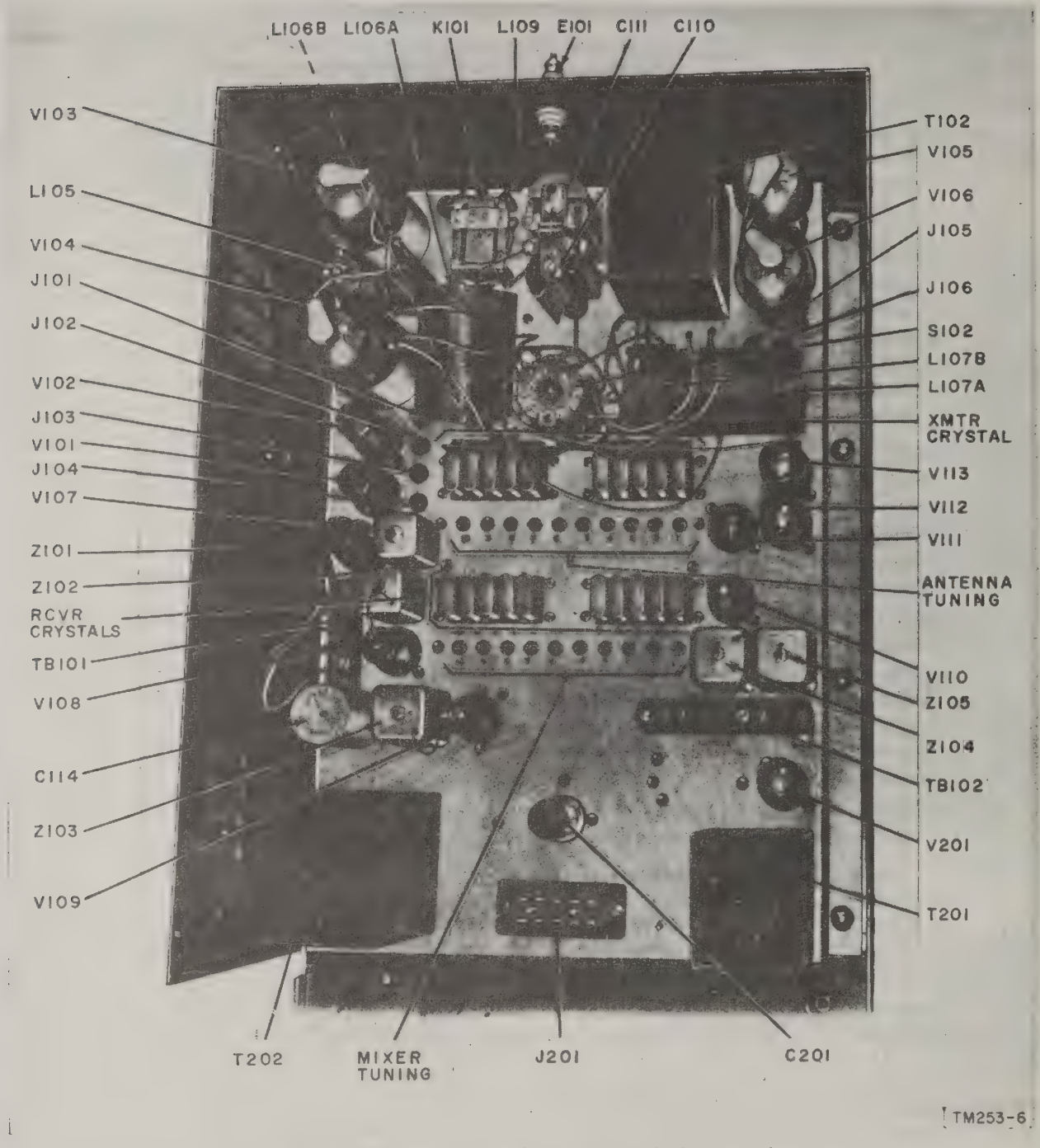


Figure 5. Radio receiver-transmitter RT-306A/SRC-8, rear view.

metal poles and guy wires. The swivel base permits mounting of the antenna on the deck or on superstructure. Only a few inches of deck space is required but there must be rigid support at least 4 feet from the base. Deck space for lowering should also be provided.

(1) Place the antenna base assembly at the selected mounting position. Orient the base so that the mounting hole in the base insulator is at right angles to the bulkhead to which the latch block is to be secured. Secure the base to the deck or bulkhead with the four No. 12 oval head wood screws (1 inch).

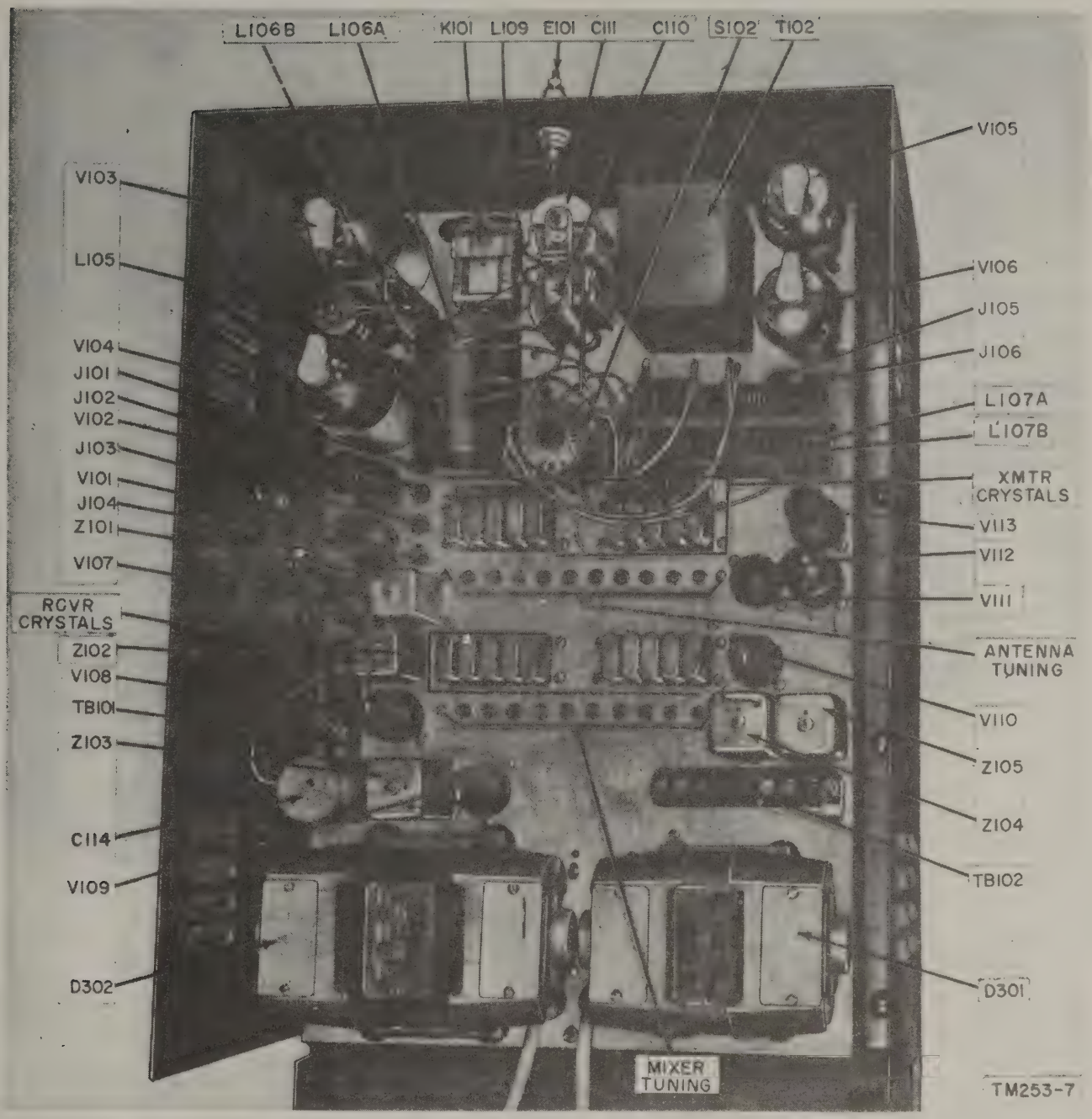


Figure 6. Radio receiver-transmitter RT-327A/SCR-8XX, rear view.

(2) Slide the 14-foot antenna mast section over the base insulator; be sure that the mounting hole in the mast is alined with the mounting hole in the base insulator. Insert the ¼-20 by 2-inch roundhead machine screw through the mounting hole. Assemble the ¼-inch diameter internal tooth lockwasher, the ¼-inch diameter terminal lug, and the ¼-20 hexagonal nut to the machine screw. Tighten securely.

(3) Raise the mast into an upright position. Position the latch block on the antenna mast by unscrewing the wingnut on the latch block and rotating the latch upward. The latch block should be installed so that this latch opens upward and not downward. Secure the latch block to the mast, at least 48 inches above the base assembly, by closing the latch and tightening the wingnut. Secure the latch block to the

bulkhead with the two No. 16 by 2-inch roundhead wood screws. A spacing block or bracket should be used if necessary, to space the latch block away from the bulkhead until the antenna stands upright.

(4) Open the latch block and lower the antenna. Screw the 9-foot antenna whip element into the top of the antenna mast. If antiseize compound, which has been applied to the threaded portion of the whip, has dried or has been wiped off because of handling, apply additional compound. Enough should be used to fill the threads.

(5) Install the rubber cap by pushing it over the top of the whip. This will seal the open end of the antenna and protect personnel when the antenna is at its lowered position.

(6) The antenna rest protects and holds the antenna in its lowered position. It should be attached to the superstructure in the

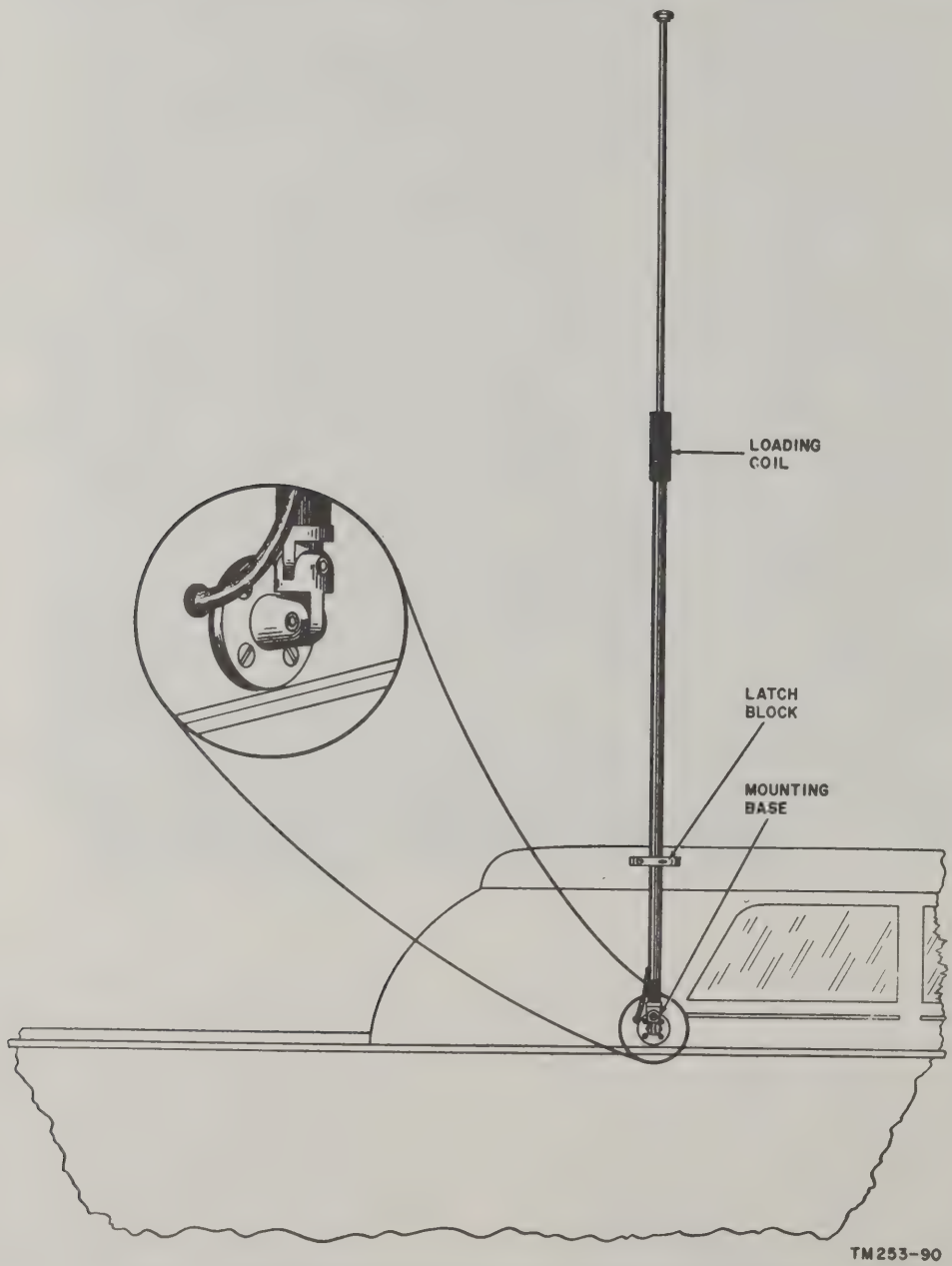


Figure 7. Typical superstructure mounting of Antenna AT-609/SRC-8.

same manner as the latch block ((4) above). Two No. 10 by ¾-inch, oval head wood screws are supplied. When passing under an obstacle, the antenna need not be lowered to deck level. Set the rest so that the top of the antenna is slightly lower than the highest fixed portion of the superstructure.

(7) Raise the antenna and secure it in the latch block.

(8) Install the antenna lead terminal by passing a ¼–20 by 2-inch machine screw through the hole provided 3 inches above the base cup and attaching terminal; use the washers and nut provided.

(9) Install a suitable bowl-type feedthrough insulator in the bulkhead near the antenna terminal or pass the wire directly through the bulkhead with a rubber grommet (fig. 7). Use brass or bronze hardware.

(10) Make connections from the antenna to the bowl insulator (if used) and from the bowl insulator to the antenna post at the top of the receiver-transmitter. Be sure that the length of lead permits lowering of the antenna. Clean all soldered joints and coat them with moisture- and fungus-resistance varnish. Secure the lead-in wire to the pillar-type standoff insulators at maximum intervals of 3 feet.

d. Ground System.

(1) *Metal-hulled vessels.* Attach the ground lead to any point, near the receiver-transmitter, that is an integral part of the hull. Do not attach the lead to shelves, lockers, and similar objects that are merely bolted in place. At the point of attachment, be sure that the metal is clean. Use a hand grinder or emery cloth and polish until a bright metallic surface is reached. After attaching the ground lead, the surface may be refinished in accordance with standard ships' maintenance instructions.

(2) *Wooden-hulled vessels.* Wooden-hulled vessels require a grounding plate. A copper plate with a surface area of no less than 12 square feet (no less than 24 square feet for ships operating in fresh water) should be fixed to the hull below the water line. Secure the ground plate to the hull with roundhead brass wood screws approximately 4 inches apart along the outer edges of the plate. Install a ⅜–24 brass or bronze bolt through the ground plate and hull so that it extends at least 2 inches into the ship. Secure the bolt in place and braze or silver-solder the bolt head to the grounding plate. In some cases, a large metal object such as the engine, tanks, boiler, or fresh water cooling system with outboard cooling elements can be used for ground when they present a considerable surface to the water. The ground lead should be kept as short as possible by running it as directly as possible to the receiver-transmitter. Clamp securely to any available bulkhead or overhead.

Section II. INITIAL ADJUSTMENT OF EQUIPMENT

15. Extent of Initial Adjustments

The procedures outlined in paragraphs 16 and 17 must be performed before the transmitter and receiver can be used for the routine operation described in chapter 3. Whenever an assigned operating channel is changed, the tuning procedures must be repeated for that channel.

16. Presetting Receiver

a. General. Presetting the receiver is accomplished after the crystals have been inserted (par. 14*a*(6)) by adjusting the antenna and mixer trimmer capacitors for each channel. Note that the receiver crystal frequency differs from the receiver frequency by 456 kc.

b. Receiver Tuning. With the POWER switch in the ON position, set the SQUELCH control to OFF and advance the VOLUME control clockwise. With a small screwdriver, adjust the RECEIVER MIXER trimmer (figs. 5 and 6) for the selected channel until maximum hiss noise is heard in the speaker. For most receiver frequencies, two such points can be located on the trimmer. Select the most clockwise tuning point which provides noise

output; then, with the screwdriver, adjust the corresponding ANTENNA TUNING trimmer (figs. 5 and 6) for maximum noise or signal output. Repeat for all channels for which crystals have been installed.

17. Presetting Transmitter

a. General. To preset the transmitter after the crystals have been inserted (par. 14*a*(6)), adjust the plate, coupling, and antenna coil adjustments for each channel. Use Multimeter TS–297/U in making these initial adjustments.

b. Channel Grouping. Because transmitter channel frequencies are normally assigned in groups, the transmitter is wired so that adjacent channels have common tuning, and one adjustment is sufficient for a group.

c. Transmitter Tuning Adjustment Clips. Transmitter tuning is accomplished by adjusting the inductance (number of turns) of plate coil L106A, antenna tuning coil L107A, and coupling link coil L107B by means of clips which can select the correct turns on the appropriate coils. Be careful in attaching these clips. They can be moved sideways and cause adjacent turns to be shorted together. Always inspect the clips and adjust their position to be at right angles to the coil surface.

(1) The transmitter is wired so that the following channels have clips in common as indicated below:

(*a*) *Plate and antenna clips.*

Common channels	Plate clip color (blue leads)	Antenna clip color (yellow leads)
No. 1, 2, and 3	brown	brown
No. 4, 5, and 6	yellow	yellow
No. 7 and 8	green	green
No. 9	white	white
No. 10	black	black

(*b*) *Coupling link clips.*

Common channels	Coupling link clip color (grey leads)
No. 1, 2, 3, and 4	brown
No. 5, 6, 7, and 8	green
No. 9 and 10	white

(2) If many separated independent channels are required, the switches can be rewired by the addition of coil clips with their leads. No underchassis changes are required for independent channel modification.

d. Initial Transmitter Plate Tuning. Set the multimeter to the 0- to 400-milliampere (ma.) range and connect to PA CATH jacks J101 and J102 (figs. 5 and 6). Set the channel switch to the No. 1 position. Disconnect the antenna lead from the antenna post on top of the cabinet. Remove all clips from all coils. Set plate capacitor C110 (figs. 5 and 6) to half capacity. Select the No. 1 channel plate lead clip (blue lead, brown clip) and, with the handset button depressed, run the plate clip down plate coil L106A until a turn is located at which the milliammeter reads minimum current. Fasten the clip to the selected plate coil turn. Connect the coupling clip lead (grey lead, brown clip) to the third turn of link coil L107B from the channel switch end. Adjust plate capacitor C110 for minimum pa. cathode current.

Note. Do not keep the transmitter on longer than 30 seconds while tuning or excessive current may damage the amplifier tubes.

e. Initial Transmitter Antenna Tuning. Connect the antenna lead to the antenna post on top of the cabinet. Set antenna capacitor C111 (figs. 5 and 6) to half capacity. Select the antenna clip lead (yellow lead, brown clip) and run it over antenna coil L107A for maximum pa. cathode current, while the handset button is depressed. Fasten the clip in place, and tune antenna capacitor C111 for maximum pa. cathode current.

f. Initial Antenna Coupling Adjustment. Note maximum pa. cathode current (*e* above). If the reading is between 180 and 220 ma., no further adjustment is necessary. If the pa. cathode current is less than 180 ma., increase the number of coupling link turns (grey lead, brown clip) 1 turn at a time until current is approximately 200 ma. If the pa. cathode current is more than 220 ma., decrease the number of link turns until the pa. cathode current is approximately 200 ma. Retune antenna capacitor C111 for maximum current.

g. Initial Group Transmitter Tuning. If a group of adjacent frequencies is to be used in channels 1, 2, and 3, the tuning adjustments may need slight modification for uniform output. Remove the antenna lead and read the pa. cathode current for positions 1, 2, and 3. If the current readings differ widely, adjust plate capacitor C110 for minimum average current over the three channels. Reconnect the antenna and readjust antenna capacitor

C111 slightly to obtain pa. cathode current readings between 180 and 220 ma. on the three channels.

h. Adjustment of Remaining Transmitter Channels. The sequence of adjustments should be repeated on the remaining channels (*d, e, f,* and *g* above) except that tuning capacitors C110 and C111 should not be adjusted further. All tuning is accomplished by careful adjustment of the coil clips. The clips are identified by color as shown in *c*(1) above. The following chart lists the approximate position of the plate taps on plate coil L106A for various typical frequencies. The link tap positions vary with antennas and generally are located between 2 and 7 turns from the left end of link coil L107B.

Frequency (kc)	Number of turns from top end of plate coil L106A
2,000	1
2,182	5
2,400	10
2,738	14
3,000	17
3,200	19
3,350	21
3,500	22

18. Testing Spare Parts

Test each running spare (except dynamotor brushes) by substitution. Tag or mark each spare for *rapid* identification. Repack carefully in weatherproof and shockproof containers. Mark the outside of each container as to contents. Stow the containers in dry, well-ventilated spaces below deck. Secure against ship's movement and the possibility of contact with other gear.

CHAPTER 3

OPERATION

Section I. CONTROLS

19. General

Haphazard or improper settings of the controls can cause improper operation and possibly total loss of communication. For this reason, it is important to know the function of every control. This section locates, illustrates, and describes the use of the various controls of the radio sets and Radio Set Control C–1429A/SRC–8.

20. Controls and Their Functions

a. Receiver-Transmitter Controls (fig. 8). The following chart lists the controls of the receiver-transmitter and their functions.

Control	Function
POWER switch	In ON position, connects radio set to power source of vessel.
Channel selector switch.	Selects operating channel of receiver-transmitter.
VOLUME control	Adjusts audio output level of receiver. In OFF position receiver is silent.
SQUELCH control	Silences receiver when no signals are being received. In OFF position, receiver has maximum sensitivity.
OUTPUT switch	Determines output function. In SPKR position, connects receiver output to local speaker. In PHONE position, connects receiver output to handset earphone. In REMOTE position, connects receiver output to remote control and transfers ON-OFF control of transmitter to the remote control. In PAGE position, disconnects transmitter and receiver functions so that speech into local handset will be heard only at remote station.
Press-to-talk local handset control.	Depressing button in center of handset de-energizes the receiver and energizes the transmitter. With the OUTPUT switch in the PAGE or REMOTE position, the handset button is disconnected.

b. Radio Set Control C–1429A/SRC–8 Controls (fig. 9). The following chart lists the controls of the remote control:

Control	Function
POWER switch	In ON position, connects the radio set to ship's power source when OUTPUT switch at receiver transmitter is set to REMOTE position.
VOLUME control	Adjusts speaker or handset audio level (at remote control). It is limited by receiver VOLUME control setting.
OUTPUT switch	Connects audio output from receiver to either speaker or handset of remote unit.
Press-to-talk button on remote handset.	Depressing button in center of handset de-energizes the receiver and energizes the transmitter when OUTPUT switch at receiver-transmitter is in REMOTE position.

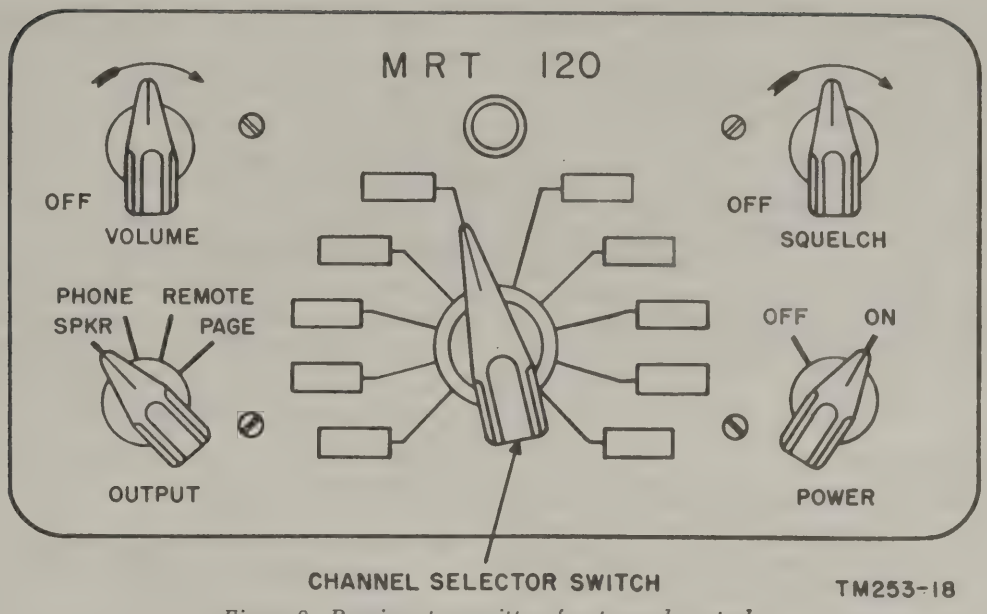


Figure 8. Receiver-transmitter, front panel controls.

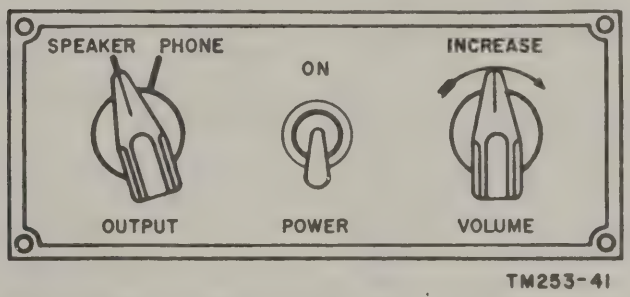


Figure 9. Radio set control C-1429A/SRC-8, front panel controls.

Section II. OPERATING PROCEDURES

Note. The operating procedures that follow include the use of extended facilities provided by Radio Set Control C-1429A-SRC-8. This permits the radio set to be operated remotely as well as at the receiver-transmitter although channel selection can only be made at the receiver-transmitter.

21. Operating Frequencies

a. Typical channels used in marine services which may be incorporated in addition to the military frequencies assigned are as follows:

Service	Receiving and transmitting frequency (kc)
Emergency and calling frequency (International)	2,182
Ship-to-Ship (International)	2,638
Ship-to-Ship (U. S. Coastal waters only)	2,738
Ship-to-Ship (Great Lakes only)	2,003
Ship-to-Ship (Gulf of Mexico only)	2,830
U. S. Coast Guard	2,670

b. To establish communications with nonmilitary services, place the call on the international calling frequency of 2,182 kc on which these services (Coast Guard, harbor police, and local coastal authorities) provide standby watch. After establishing contact, switch to a working frequency mutually agreed upon.

22. Starting Procedures

a. Preliminary. Set the receiver-transmitter front panel controls as follows:

Control	Position
POWER	OFF
VOLUME	Half rotation
Channel selector	Channel desired
SQUELCH	OFF
OUTPUT	SPKR or PHONE

Caution: Operation of the receiver-transmitter with the OUTPUT switch in the PAGE position without Radio Set Control C–1429A/SRC–8 connected can cause damage to the equipment.

b. Starting. Set the POWER switch to the ON position. The indicator lamp will light and, in Radio Sets AN/SRC–8 and AN/SRC–8AZ, inverter D401 in the converter-dynamotor will start. In Radio Set AN/SRC–8XX, dynamotor D302 in the receiver-transmitter will start. After a 30-second warm up, noise or signals will be heard in the speaker.

23. Local Operation

Note. Federal Communications Commission regulations require monitoring and calling on the international calling and distress frequency of 2,182 kc. Immediate switching to a working channel is mandatory after communication is established.

a. Reception.

(1) Adjust the VOLUME control to the desired signal level.

(2) Wait until the channel is clear and slowly rotate the SQUELCH control clockwise until the background noise disappears.

Note. As the SQUELCH is adjusted clockwise, sensitivity is reduced. For reception of weak signals, turn the SQUELCH control to OFF. Readjust the SQUELCH control as necessary because background noise level changes in relation to time of day, weather, and location.

(3) The OUTPUT control may be switched from SPKR to PHONE connecting the receiver output to the handset earpiece if privacy is required. This should also be done if local noise level is high and the speaker cannot be heard.

b. Transmission. Listen on the channel to see that it is clear of other calls with which the set might interfere. Press the button in the handset and call the desired station. This turns on the high-voltage dynamotor in the converter-dynamotor (in Radio Set AN/SRC–8XX, in the receiver-transmitter). Release the handset button upon completion of message. Remember to press the handset button while speaking, release to listen.

Note. The high-voltage dynamotors are designed for intermittent operation. Do not hold the handset button depressed for longer than 5 minutes at a time.

c. Paging or Deck Calling. Deck calling is accomplished from the receiver-transmitter location by setting the OUTPUT switch to the PAGE position. Set the OUTPUT switch at the remote control to the SPEAKER position. Talk into the local handset and adjust the VOLUME control for the desired loudness. The speech will be heard at the remote speaker. It will not be radiated by the transmitter.

24. Operation Using Radio Set Control C–1429A/SRC–8

With the receiver-transmitter OUTPUT switch set at REMOTE, SPEAKER or PHONE reception and push-to-talk transmission are possible at the remote control. The channel must be selected, and any SQUELCH adjustments made, at the receiver-transmitter.

a. Turn the POWER switch to the ON position to energize the receiver-transmitter.

b. Select SPEAKER or PHONE reception by setting the OUTPUT switch.

c. Adjust the volume by turning the VOLUME control knob.

Note. Maximum volume at the remote location is limited by the setting of the receiver-transmitter VOLUME control.

d. Press the button in the center of the handset for push-to-talk transmission; release for reception.

25. Stopping Procedure

The entire equipment is placed in a standby condition when the handset push botton is released after transmitting. If no calls are expected and the ship is designated as *off duty,* the entire equipment in shut down by placing both POWER switches of the receiver-transmitter and the remote control to the OFF position.

CHAPTER 4

ORGANIZATIONAL MAINTENANCE

Organizational maintenance is maintenance performed at first and second echelon. First echelon maintenance is operator's maintenance; second echelon is unit repairman's maintenance. This maintenance is performed on board the vessel.

Section I. OPERATOR'S MAINTENANCE

26. Scope of Operator's Maintenance

a. The following is a list of maintenance duties normally performed by the operator. These procedures do not require special tools or test equipment:

(1) Preventive maintenance (par. 27).

(2) Replacement of defective pilot lamps (par. 29).

(3) Replacement of defective fuse (par. 29).

(4) Checking cable connections.

(5) Replacement of tubes.

b. The following materials are required by the operator in performing maintenance:

(1) Cleaning Compound (Federal stock No. 7930–395–9542).

(2) Cheesecloth, lint-free.

(3) Sandpaper, flint No. 000.

27. Operator's Preventive Maintenance

a. General Preventive Maintenance Techniques.

(1) Use No. 000 sandpaper to remove corrosion.

(2) Use a clean, dry, lint-free cloth or a dry brush for cleaning. If necessary, wipe any parts, including electrical contacts, with a cloth moistened with Cleaning Compound; then wipe them dry with a cloth.

Caution: Prolonged breathing of Cleaning Compound fumes is dangerous. Make sure adequate ventilation is provided. Cleaning Compound is flammable; do not use near a flame.

b. Use of DA Form 11–238. DA Form 11–238 (fig. 10) is a preventive maintenance check list to be used by the operator. Items not applicable to the radio set are lined out in the figure. References in the ITEM block in the figure are to paragraphs which contain additional maintenance information about the particular item. Instructions for the use of the form appear on the back of the form.

c. Items. The information in this subparagraph is supplementary to DA Form 11–238. The item numbers correspond to the ITEM numbers on the form.

Item	Maintenance procedures
5	All controls should work smoothly. The VOLUME and SQUELCH controls should not be noisy. To eliminate noise, apply drops of Cleaning Compound so that they run down the control shafts.
7	Inspect the antenna mounting base, latch block, and rest bracket for loose screws, bolts, and fasteners.
8	Wipe exteriors of cases and antenna periodically or at signs of salt deposit. Use a soft cloth moistened with a light oil.
9	Examine the antenna lead and other cables for loose connections, breaks in the insulation, and broken or frayed strands at connections. Cover minor cuts in the insulation with rubber tape and friction tape.
10	Examine the antenna sections for loose, dirty, or corroded joints. If the whip section is bent or damaged, do not attempt repairs while it is mounted. Lower the mast; disassemble and replace it with the spare mast. Make sure the rubber cap is fitted tightly at top of the whip section. Put the whip in as good condition as possible and stow until it may be needed to replace the spare or until replacement is made. Examine insulators for cracks, dirt, and salt deposits.
12	Inspect spare parts stowage for security at sea.

OPERATOR FIRST ECHELON MAINTENANCE CHECK LIST FOR SIGNAL CORPS EQUIPMENT

RADIO COMMUNICATION, DIRECTION FINDING, CARRIER, RADAR

INSTRUCTIONS: See other side

EQUIPMENT NOMENCLATURE	EQUIPMENT SERIAL NO.
RADIO SET AN/SRC-8A2	

LEGEND FOR MARKING CONDITIONS: ✓ Satisfactory; X Adjustment, repair or replacement required; Ⓧ Defect corrected.
NOTE: Strike out items not applicable.

DAILY

NO.	ITEM	CONDITION S	M	T	W	T	F	S
1	COMPLETENESS AND GENERAL CONDITION OF EQUIPMENT (*receiver, transmitter, ~~carrying cases~~, wire and cable, ~~microphones, tubes~~, spare parts, technical manuals and accessories*).							
2	~~LOCATION AND INSTALLATION SUITABLE FOR NORMAL OPERATION.~~							
3	CLEAN DIRT AND MOISTURE FROM ANTENNA, ~~MICROPHONE, HEADSETS, CHESTSETS, KEYS, JACKS, PLUGS,~~ TELEPHONE, ~~CARRYING BAGS,~~ COMPONENT PANELS.							
4	INSPECT SEATING OF READILY ACCESSIBLE "PLUCK-OUT" ITEMS: ~~TUBES~~, LAMPS, CRYSTALS, FUSE, CONNECTORS, ~~VIBRATORS, PLUG-IN COILS AND RESISTORS.~~							
5	INSPECT CONTROLS FOR BINDING, SCRAPING, EXCESSIVE LOOSENESS, ~~WORN OR CHIPPED GEARS, MISALIGNMENT~~, POSITIVE ACTION. PAR. 27c							
6	CHECK FOR NORMAL OPERATION. PAR. 23							

WEEKLY

NO.	ITEM	CONDITION	NO.	ITEM	CONDITION
7	CLEAN AND TIGHTEN EXTERIOR OF COMPONENTS AND CASES, ~~RACK MOUNTS, SHOCK MOUNTS~~, ANTENNA MOUNTS, COAXIAL TRANSMISSION LINES, ~~WAVE GUIDES~~, AND CABLE CONNECTIONS PAR. 27c		13	~~INSPECT STORAGE BATTERIES FOR DIRT, LOOSE TERMINALS, ELECTROLYTE LEVEL AND SPECIFIC GRAVITY, AND DAMAGED CASES.~~	
8	INSPECT CASES, MOUNTINGS, ANTENNAS, ~~TOWERS~~, AND EXPOSED METAL SURFACES, FOR RUST, CORROSION, AND MOISTURE. PAR. 27a,c		14	CLEAN ~~AIR FILTERS~~, BRASS NAME PLATES, ~~DIAL AND METER WINDOWS~~, JEWEL ASSEMBLIES.	
9	INSPECT CORD, CABLE, WIRE, ~~AND SHOCK MOUNTS~~ FOR CUTS, BREAKS, FRAYING, DETERIORATION, KINKS, AND STRAIN. PAR. 27c		15	~~INSPECT METERS FOR DAMAGED GLASS AND CASES.~~	
10	INSPECT ANTENNA FOR ECCENTRICITIES, CORROSION, LOOSE FIT, DAMAGED INSULATORS, ~~AND REFLECTORS.~~ PAR. 27c		16	~~INSPECT SHELTERS AND COVERS FOR ADEQUACY OF WEATHERPROOFING.~~	
11	~~INSPECT CANVAS ITEMS, LEATHER, AND CABLING FOR MILDEW, TEARS, AND FRAYING.~~		17	~~CHECK ANTENNA GUY WIRES FOR LOOSENESS AND PROPER TENSION.~~	
12	INSPECT FOR LOOSENESS OF ACCESSIBLE ITEMS: SWITCHES, KNOBS, JACKS, ~~CONNECTORS, ELECTRICAL TRANSFORMERS, POWERSTATS, RELAYS, SELSYNS~~, MOTORS, ~~BLOWERS, CAPACITORS~~, GENERATORS, AND PILOT LIGHT ASSEMBLIES. PAR. 27c		18	~~CHECK TERMINAL BOX COVERS FOR CRACKS, LEAKS, DAMAGED GASKETS, DIRT AND GREASE.~~	

19 IF DEFICIENCIES NOTED ARE NOT CORRECTED DURING INSPECTION, INDICATE ACTION TAKEN FOR CORRECTION.

DA FORM 1 MAY 51 11-238 REPLACES DA AGO FORM 419, 1 DEC 50, WHICH IS OBSOLETE.

TM253-50

Figure 10. DA Form 11-238.

28. Visual Inspection

When the radio set fails to operate properly, turn off the power and check all the items listed below.

a. Setting of switches (par. 23).

b. Cables or antenna connecting wire poorly connected.

c. Grounded or broken antenna or antenna lead-in wire.

d. Bad ground connection (par. 14*d*).

e. Burned out fuse in converter-dynamotor (Radio Set AN/SRC–8 or AN/SRC–8AZ only). If the replacement fuse also burns out, higher echelon repair is required.

f. Tubes that do not light or become warm or that have broken envelopes.

g. Connection of plate or grid caps to tubes (figs. 5 and 6).

29. Operator's Repairs and Adjustments

a. Replacement of Receiver-Transmitter Dial Lamp.

(1) Remove the four screws that hold the front cover.

(2) Reach behind the recessed black switch panel and remove the lamp by depressing and turning it ½ turn counterclockwise.

(3) Install the new lamp by pressing in and turning it ½ turn clockwise.

(4) Replace the front cover.

b. Replacement of Fuse (Radio Sets AN/SRC–8 and AN/SRC–8AZ only). The only fuse in the radio set is located in the converter-dynamotor.

(1) Remove the six screws which secure the converter-dynamotor cover.

(2) Loosen the fuse cap (XF401, fig. 2) and extract the blown fuse.

(3) Replace with a spare 2-ampere Slo-Blo fuse. Replace the fuse cap and converter-dynamotor cover.

Caution: If the fuse blows again, higher echelon repair is required.

c. Replacement of Tubes. Replace only tubes which are obviously defective. These have cracked envelopes, do not light, or do not become warm within several minutes of operation.

(1) Remove the grid or plate cap from the tube (if applicable) several minutes after turning the power off.

(2) Remove the tube and replace it with a tube of the same type. Replace the grid or plate cap.

(3) Check to see that the tube lights or becomes warm after the power is turned on. *If the new tube does not light, do not discard the old tube. Higher echelon repair is required.*

d. Replacement of Cable or Antenna Lead-In. If Electrical Special Purpose Cable Assembly CX–3761/SRC–8 (Radio Sets AN/SRC–8 and AN/SRC–8AZ only) or the antenna lead-in wire is cut or frayed, replace it. A spare remote control cable is supplied. Follow the procedures given in paragraph 14*a* for replacement.

Section II. UNIT REPAIRMAN'S MAINTENANCE

30. Scope of Unit Repairman's Maintenance

a. Following is a list of maintenance duties performed by the unit repairman. The scope of these instructions has been determined by the available tools, materials, test equipment, parts, and MOS of the unit repairman.

b. Unit repairman's maintenance of the radio set consists of:

(1) Preventive maintenance (par. 32).

(2) Trouble shooting (pars. 34 and 35).

(3) Replacement of defective vacuum tubes (par. 36).

(4) Repair of defective cables.

(5) Replacement of brushes in dynamotors and inverter.

31. Tools, Materials, and Test Equipment Required

The tools, materials, and test equipment required for unit repairman's maintenance are as follows:

a. Tools.

Tool Equipment TE–61.

b. Materials.

(1) Cleaning Compound (Federal stock No. 7930–395–9542).

(2) Cheesecloth, lint-free.

c. Test Equipment.

(1) Multimeter TS–297/U.

(2) Electron Tube Test Set TV–7/U.

32. Unit Repairman's Preventive Maintenance

a. Use of DA Form 11–239. DA Form 11–239 (fig. 11) is a preventive maintenance check list to be used by the unit repairman. Items not applicable to the equipment are lined out in the figure. References in the ITEM block in the figure are to paragraphs that contain additional maintenance information pertinent to the particular item. Instructions for the use of the form appear on the back of the form.

b. Items. The information shown in this subparagraph is supplementary to DA Form 11–239. The item numbers correspond to the ITEM numbers on the form.

Caution: Disconnect all power from the radio set before performing the following operations. When maintenance is completed, reconnect power and check for satisfactory operation.

Item	Maintenance procedures
19	Inspect the tubes, without removing them, for loose envelopes. Check plate cap connections on the four 807 and the 6K8, 6K7, and 6B8 tubes. Remove dust and dirt carefully; do not remove tubes to check for emission, cracked tube sockets, or insufficient spring tension. Frequent tube removal for inspection shortens tube and socket life unnecessarily.
22	Check and clean relay contacts in receiver-transmitter and (in Radio Sets AN/SRC–8 and AN/SRC–8AZ) on under section of converter-dynamotor (fig. 36).
30	Inspect inverter (Radio Sets AN/SRC–8 and AN/SRC–AZ only) and dynamotors for signs of overheating, loose mountings; loose, frayed, or damaged connections. Check to see that the commutator is smooth and clean. Replace brushes.

33. Unit Repairman's Visual Inspection

Before operating the equipment, inspect it. This may save repair time and prevent damage to the set. Inspect the following for obvious defects:

a. The items listed in paragraph 28.

b. Connections at the terminal boards for the handset, the remote control and, in Radio Sets AN/SRC–8 and AN/SRC–8AZ, in the converter-dynamotor.

c. Condition of inverter and dynamotor commutators and brushes.

d. Condition of relay contacts.

34. Troubleshooting by Using Equipment Performance Checklist

The equipment performance checklist will assist the unit repairman to locate the trouble in the equipment systematically. All corrective measures which the unit repairman can perform are given in the CORRECTIVE measures column. When using the checklist, start at the beginning and follow each step in order. In some cases, the abnormal indication permits immediate localization of trouble to a particular part and the corrective measure indicates the specific part to be repaired or replaced. In other cases, however, the abnormal indications only sectionalize the trouble to a particular group of parts. In these latter cases, the corrective measures call for additional testing procedures to localize the trouble. When the procedure referred to is beyond the scope of organizational maintenance personnel, trouble shooting at a higher echelon is required. Note on the repair tag how the equipment performed and what corrective measures were taken.

SECOND AND THIRD ECHELON MAINTENANCE CHECK LIST FOR SIGNAL CORPS EQUIPMENT
RADIO COMMUNICATION, DIRECTION FINDING, CARRIER, RADAR

INSTRUCTIONS.—See other side

EQUIPMENT NOMENCLATURE: RADIO SET AN/SRC-8A2

EQUIPMENT SERIAL NO.

LEGEND FOR MARKING CONDITIONS: √ *Satisfactory;* X *Adjustment, repair, or replacement required;* ⊗ *Defect corrected.*
NOTE: *Strike out items not applicable.*

NO.	ITEM	CONDITION
1	COMPLETENESS AND GENERAL CONDITION OF EQUIPMENT (*receiver, transmitter, carrying cases, wire and cable, microphones, tubes, spare parts, technical manuals, and accessories*).	
2	~~LOCATION AND INSTALLATION SUITABLE FOR NORMAL OPERATION.~~	
3	CLEAN DIRT AND MOISTURE FROM ANTENNA, ~~MICROPHONE, HEADSETS, CHESTSETS, KEYS, JACKS, PLUGS;~~ TELEPHONE, ~~CARRYING BAGS,~~ COMPONENT PANELS.	
4	INSPECT SEATING OF READILY ACCESSIBLE "PLUCK-OUT" ITEMS: ~~TUBES;~~ LAMPS, CRYSTALS, FUSE, CONNECTORS, ~~VIBRATORS, PLUG-IN COILS, AND RESISTORS.~~	
5	INSPECT CONTROLS FOR BINDING, SCRAPING, EXCESSIVE LOOSENESS, ~~WORN OR CHIPPED GEARS, MISALINEMENT,~~ POSITIVE ACTION. PAR. 27c	
6	CHECK FOR NORMAL OPERATION. PAR. 23	
7	CLEAN AND TIGHTEN EXTERIOR OF COMPONENTS AND CASES, ~~RACK MOUNTS, SHOCK MOUNTS,~~ ANTENNA MOUNTS, COAXIAL TRANSMISSION LINES, ~~WAVE GUIDES,~~ AND CABLE CONNECTIONS. PAR. 27c	
8	INSPECT CASES, MOUNTINGS, ANTENNAS, ~~TOWERS,~~ AND EXPOSED METAL SURFACES, FOR RUST, CORROSION, AND MOISTURE. PAR. 27a,c	
9	INSPECT CORD, CABLE, WIRE, ~~AND SHOCK MOUNTS~~ FOR CUTS, BREAKS, FRAYING, DETERIORATION, KINKS, AND STRAIN. PAR. 27c	
10	INSPECT ANTENNA FOR ECCENTRICITIES, CORROSION, LOOSE FIT, DAMAGED INSULATORS, ~~AND REFLECTORS.~~ PAR. 27c	
11	~~INSPECT CANVAS ITEMS, LEATHER, AND CABLING FOR MILDEW, TEARS, AND FRAYING.~~	
12	INSPECT FOR LOOSENESS OF ACCESSIBLE ITEMS: SWITCHES, KNOBS, ~~JACKS, CONNECTORS, ELECTRICAL TRANSFORMERS, POWERSTATS, RELAYS, SELSYNS,~~ MOTORS, ~~BLOWERS, CAPACITORS,~~ GENERATORS, AND PILOT LIGHT ASSEMBLIES. PAR. 27c	
13	~~INSPECT STORAGE BATTERIES FOR DIRT, LOOSE TERMINALS, ELECTROLYTE LEVEL AND SPECIFIC GRAVITY, AND DAMAGED CASES.~~	
14	CLEAN ~~AIR FILTERS,~~ BRASS NAMEPLATES, ~~DIAL AND METER WINDOWS;~~ JEWEL ASSEMBLIES.	
15	~~INSPECT METERS FOR DAMAGED GLASS AND CASES.~~	
16	~~INSPECT SHELTERS AND COVERS FOR ADEQUACY OF WEATHERPROOFING.~~	
17	~~CHECK ANTENNA GUY WIRES FOR LOOSENESS AND PROPER TENSION.~~	
18	~~CHECK TERMINAL BOX COVERS FOR CRACKS, LEAKS, DAMAGED GASKETS, DIRT, AND GREASE.~~	

NO.	ITEM	CONDITION
19	ELECTRON TUBES—INSPECT FOR LOOSE ENVELOPES, CAP CONNECTORS, ~~CRACKED SOCKETS, INSUFFICIENT SOCKET SPRING TENSION;~~ CLEAN DUST AND DIRT CAREFULLY; ~~CHECK EMISSION OF RECEIVER TYPE TUBES.~~ PAR. 32b	
20	~~INSPECT FILM CUTOUTS FOR LOOSE PARTS, DIRT, MISALINEMENT, AND CORROSION.~~	
21	INSPECT FIXED CAPACITORS FOR LEAKS, BULGES, AND DISCOLORATION.	
22	INSPECT RELAY AND CIRCUIT BREAKER ASSEMBLIES FOR LOOSE MOUNTINGS; BURNED, PITTED, CORRODED CONTACTS; MISALINEMENT OF CONTACTS AND SPRINGS; INSUFFICIENT SPRING TENSION; BINDING OF PLUNGERS AND HINGE PARTS.	
23	~~INSPECT VARIABLE CAPACITORS FOR DIRT, MOISTURE, MISALINEMENT OF PLATES, AND LOOSE MOUNTINGS.~~	
24	INSPECT RESISTORS, BUSHINGS, AND INSULATORS, FOR CRACKS, CHIPPING, BLISTERING, DISCOLORATION, AND MOISTURE.	
25	INSPECT TERMINALS OF LARGE FIXED CAPACITORS AND RESISTORS FOR CORROSION, DIRT, AND LOOSE CONTACTS.	
26	CLEAN AND TIGHTEN SWITCHES, TERMINAL BLOCKS, ~~BLOWERS, RELAY CASES,~~ AND INTERIORS OF CHASSIS AND CABINETS NOT READILY ACCESSIBLE.	
27	INSPECT TERMINAL BLOCKS FOR LOOSE CONNECTIONS, CRACKS, AND ~~BREAKS.~~	
28	~~CHECK SETTINGS OF ADJUSTABLE RELAYS.~~	
29	~~LUBRICATE EQUIPMENT IN ACCORDANCE WITH APPLICABLE DEPARTMENT OF THE ARMY LUBRICATION ORDER.~~	
30	INSPECT ~~GENERATORS, AMPLIDYNES,~~ DYNAMOTORS, FOR BRUSH WEAR, SPRING TENSION, ARCING, AND FITTING OF COMMUTATOR. PAR. 32b	
31	CLEAN AND TIGHTEN CONNECTIONS AND MOUNTINGS FOR TRANSFORMERS, CHOKES, POTENTIOMETERS, AND RHEOSTATS.	
32	~~INSPECT TRANSFORMERS, CHOKES, POTENTIOMETERS, AND RHEOSTATS~~ FOR OVERHEATING, ~~AND OIL LEAKAGE.~~	
33	~~BEFORE SHIPPING OR STORING, REMOVE BATTERIES.~~	
34	~~INSPECT CATHODE RAY TUBES FOR BURNT SCREEN SPOTS.~~	
35	~~INSPECT BATTERIES FOR SHORTS AND DEAD CELLS.~~	
36	~~INSPECT FOR LEAKING WATERPROOF GASKETS, WORN OR LOOSE PARTS.~~	
37	~~MOISTURE AND FUNGIPROOF.~~	

38 IF DEFICIENCIES NOTED ARE NOT CORRECTED DURING INSPECTION, INDICATE ACTION TAKEN FOR CORRECTION.

DA FORM 1 MAY 51 11-239 Replaces DA AGO Form 418, 1 Dec 50, which is obsolete. —16—54320-2

TM253-51

Figure 11. DA Form 11–239.

35. Equipment Performance Checklist

	Item No.	Unit	Control	Action	Normal indication	Corrective measures
PREPARATORY	1	Receiver-transmitter.	VOLUME control.	Turn full clockwise.		
	2	Receiver-transmitter.	SQUELCH control.	Set to OFF.		
	3	Receiver-transmitter.	OUTPUT switch.	Set at SPKR position.		
	4	Receiver-transmitter.	Channel selector switch.	Set to lowest channel used.		
EQUIPMENT PERFORMANCE	5	Receiver-transmitter.	POWER switch.	Set to ON position.	Inverter or dynamotor starts. (Dynamotor in receiver-transmitter in Radio Set AN/SRC-8XX; inverter in converter-dynamotor in Radio Sets AN/SRC-8 and AN/SRC-8AZ).	Check master switch from power source.
						Check dynamotor (or inverter in Radio Sets AN/SRC-8 and AN/SRC-8AZ); check Electrical Special Purpose Cable Assembly CX-3761/SRC-8.
					Indicator lamp lights.	Replace lamp.
					Background noise or signal heard in speaker.	Check fuse in converter-dynamotor (Radio Sets AN/SRC-8 and AN/SRC-8AZ).
						Check receiver section tubes V107 through V113 (par. 36).
	6	Receiver-transmitter.	OUTPUT switch.	Set to PHONE position.	Noise or signal heard in handset earpiece.	Check handset, handset connections, and OUTPUT switch connections.
	7	Receiver-transmitter.	SQUELCH control.	Set OUTPUT switch to SPKR position.		
				Turn SQUELCH clockwise until receiver just squelches	No output at speaker.	Check SQUELCH control and V112B circuit.
	8	Receiver-transmitter.	VOLUME control.	Turn in both directions.	Volume increases and decreases with control position.	Check VOLUME control.
	9	Receiver-transmitter.	Channel selector switch.	Select each channel.	Noise or signal heard in speaker.	Check crystal of defective channel by substitution.
						Check switch contacts or tuning on defective channel.
	10	Converter-dynamotor.	Handset.	Press push-to-talk switch.	Dynamotor runs. (in Radio Set AN/SRC-8XX within the receiver-transmitter; in converter-dynamotor in Radio Sets AN/SRC-8 and AN/SRC-8AZ).	Check relay contacts and dynamotor brushes.

	Item No.	Unit	Control	Action	Normal indication	Corrective measures
EQUIPMENT PERFORMANCE	11	Receiver-transmitter.	Handset.	Press push-to-talk switch.	The final test of a transmitter is its ability to establish communications. Contact another station to check each channel of the transmitter for normal operation. Ask for a report on the quality of the signal transmitted and the location of the station contacted.	Check tubes V101 through V106. Check crystal and channel selector switch of defective transmitting channel.
STOPPING	12	Receiver-transmitter.	POWER switch.	Set to OFF position.	Indicator lamp goes out; dynamotors and inverters stop.	

36. Tube Testing Techniques

When trouble occurs, check all cabling, connections, and the general condition of the equipment before attempting removal of electron tubes. Try to isolate the trouble to a particular unit or section of the equipment (par. 35). *Do not discard* tubes merely because the tubes have been used for a specified length of time. Satisfactory operation in a circuit is the final proof of tube quality. The tube in use may work better than a new one.

a. Use of Tube Tester. Remove and test one tube at a time. Discard a tube only if its defect is obvious or if the tube tester shows it to be defective. Do not discard a tube that tests at or just above its minimum test limit on the tube tester. Replace the original tube, or insert a new one if required, before testing the next one.

b. Tube Substitution Method. If a tube tester is not available, troubleshoot by the tube substitution method.

(1) Replace the suspected tubes, one at a time, with new tubes. If the equipment becomes operative, discard the last tube removed.

Note. The oscillator circuit may function with one tube and not another—even though both tubes are new. Retain any removed tube until its condition is checked by a tube tester.

(2) Reinsert the remaining original tubes, one at a time, in the original sockets. If equipment failure occurs during this step, discard the last original tube. Do not leave a new tube in a socket if the equipment operates satisfactorily with the original tube.

(3) It is possible to use main output amplifier tube V113 in place of buffer amplifier V102 while testing the transmitter. The substitution may be reversed while testing the receiver alone.

(4) If tube substitution does not correct the trouble, *reinsert the original tubes in the original sockets* before forwarding the defective equipment for higher echelon repair.

37. Preferred-type Tube

A preferred-type electron tube, type 5Y3WGTA, has been developed as a direct replacement for tube type 5Y3GT in Radio Sets AN/SRC–8 and AN/SRC–8AZ. These tubes may be used interchangeably in power rectifier stage V101. The older type tube should be used until stocks are exhausted.

CHAPTER 5

AUXILIARY EQUIPMENT

38. Purpose of Radio Set Control C–1429A/SRC–8

(fig. 1)

The remote control (fig. 1) is a limited extension of the control facilities of the radio set. By use of the remote control, the receiver-transmitter can be turned on and reception and transmission can take place from the remote site (par. 24). It is confined, however, to operation within the channel selected by the channel selector switch on the receiver-transmitter. The volume of reception is limited to the maximum set at the VOLUME control. A second use of the remote control is for deck calling or paging when the OUTPUT switch at the receiver-transmitter is set to the PAGE position.

39. Installation of Remote Control

Two inverted keyhole type holes are used for mounting the remote control to a bulkhead or similar surface. Use two No. 10 roundhead wood screws to mount the unit to the bulkhead. If the unit is to remain portable, drive the head of the screw to within ¼ inch of the mounting surface. Otherwise, set the unit in place and tighten the two screws securely. There is a handle on the top cover for portable use, if required. Twenty-foot Electrical Special Purpose Cable Assembly CX–3760/SRC–8 connects to TB102 (figs. 5 and 6). Pass the cable through holes in the cabinet and, depending on the installation, through the shelf or bulkhead in the same manner as the power cable (par. 14*a* and fig. 4). The screw terminals on REMOTE terminal board TB102 are painted to correspond with the colors of the connecting leads.

40. Operation of Remote Control

Operation of the remote control in conjunction with the radio set is described in paragraph 24. The POWER switch at the remote control (fig. 9) can turn the receiver-transmitter on and off and the OUTPUT switch determines whether the receiver audio output (or the paging call) is heard at the remote control speaker or handset. The VOLUME control adjusts the audio signal to the remote control speaker or handset. The handset button, when depressed, switches the set function from reception to transmission.

41. Maintenance of Remote Control

The preventive maintenance techniques outlined in paragraph 27 apply to the remote control. Record preventive maintenance of the unit on Forms DA 11–238 and DA 11–239 (figs. 10 and 11). Use an insulated plastic or canvas cover for the remote control when sailing in arctic waters. If the remote control is used in a fixed position on the exposed deck, provide a permanently heated or insulated shelter.

42. Troubleshooting Remote Control

(fig. 12)

Troubleshooting the remote control is most easily accomplished by use of a continuity meter. The following chart gives the readings to be expected when checking at the detached leads of the remote control cable. The lowest ohmmeter range scale is used. Switch positions are listed only if necessary to the check.

From—	To—	Switch and position	Correct reading (ohms)	Probable trouble
Gray lead	Case		0	Open gray lead.
Brown lead	Orange lead	POWER switch OFF.	∞	Shorted S502.
Brown lead	Orange lead	POWER switch ON.	0	Defective S502; open brown or orange lead.
Green lead	Red lead	POWER switch ON.	∞	Handset button shorted.

From—	To—	Switch and position	Correct reading (ohms)	Probable trouble
Green lead	Red lead	POWER switch ON; handset button pressed.	0	Handset button defective, green or orange lead open; S502 defective.
Black lead	Red lead	Handset button pressed.	50 (approx)	Microphone circuit in handset open.
White lead	Red lead	OUTPUT switch in SPEAKER position.	0 to 15 (depending on position of VOLUME control).	Open speaker coil if resistance is 20 with VOLUME control at maximum; open red or white lead; open R502.
White lead	Red lead	OUTPUT switch in PHONE position.	0 to 21 (depending on position of VOLUME control).	Open R501; defective S501.

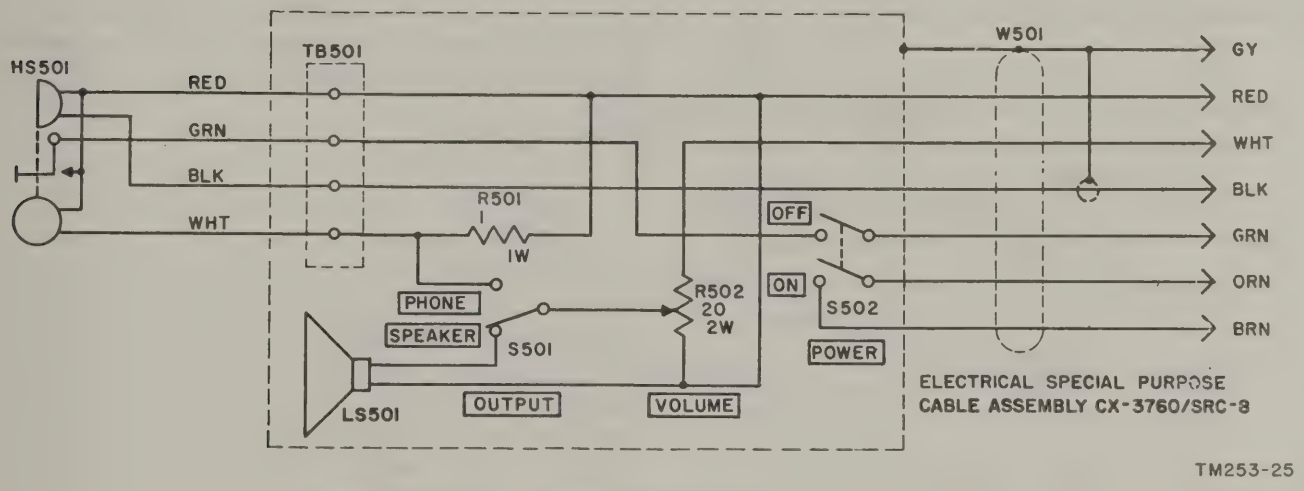


Figure 12. Radio set control C-1429A/SRC-8, schematic diagram.

43. Remote Control Unit Repairs

All components of the remote control use standard mounting devices, are easily accessible, and need no special techniques for removing. All components are mounted on the rear of the front panel. The case is opened by removing screws at the sides of the front cover.

CHAPTER 6

THEORY

Section I. RECEIVER SECTION

44. Block Diagram Receiver Section

(fig. 13)

The receiver section uses a superheterodyne circuit with automatic volume control (avc) capable of receiving am signals within the frequency range of 2.0 and 3.5 mc. For complete receiver circuit details, refer to paragraphs 45 through 50.

a. Signal voltages from the antenna are fed into type 6SK7 RF amplifier V107. The signal of the desired frequency is amplified and other signals are attenuated. The output is fed to the mixer section of converter V108. The triode section of the 6K8 converter is an oscillator that operates at 456 kc above the incoming signal. The oscillator signal beats with the incoming signal in the mixer section of V108. The 456-kc resultant signal is then applied to first intermediate frequency (IF) amplifier V109. The first IF amplifier amplifies the 456-kc signal and rejects all other frequencies. The output of this amplifier is amplified in second IF amplifier stage V110A, and is coupled to the detector-avc stage, the diode portion of V110. Detector V110B demodulates the IF signal and presents the demodulated (audio) voltage to first audio amplifier V112A. The first audio amplifier provides amplification to drive af output stage V113 which in turn amplifies the audio and drives the speaker or headset.

b. One section of tube V111 prevents the dc bias voltage for avc from going positive in the absence of signals, and noise limiter section V111A limits the noise peaks that may be present at the second detector output. Squelch stage V112B, adjusted by the SQUELCH control, acts as an off-on switch for the first audio amplifier. When there is little or no signal input, the squelch renders the first AF amplifier inoperative and thereby eliminates any audio output under a no-signal condition.

45. RF Amplifier Stage

(fig. 14)

RF signal voltages are fed from the antenna through spark suppression choke L109 and the normally closed contact of relay K101 to the primary of antenna coil Z101. Spark gap E101 and spark suppression choke L109 protect the antenna input circuit from high voltages which may be induced in the antenna by lightning. The spark suppression choke offers a high impedance but if the induced voltage should rise to sufficient magnitude to cause damage, an arc to ground through the spark gap protects the circuit. The signal voltages are coupled through the secondary of Z101 to the grid of RF amplifier tube V107. The grid return of the Z101 secondary is connected to the avc line and bypassed to ground by capacitor C115. The secondary of Z101 is tuned to the desired frequency by fixed capacitor C117 in parallel with appropriate trimmer capacitor C116 selected by channel switch S101C. Resistor R115 bypassed by C118 provides cathode bias for RF amplifier V107. Resistor R116 is the screen dropping resistor for this stage and for converter V108. Capacitor C119 bypasses the screens to ground. During transmission, resistor R103 couples negative voltage developed (par. 53) at the grid of buffer amplifier V102 to the screens of V107 and V108 to silence the receiver during transmission. The primary of RF transformer Z102 is the plate load for RF amplifier V107, and capacitor C120 completes the RF return to ground.

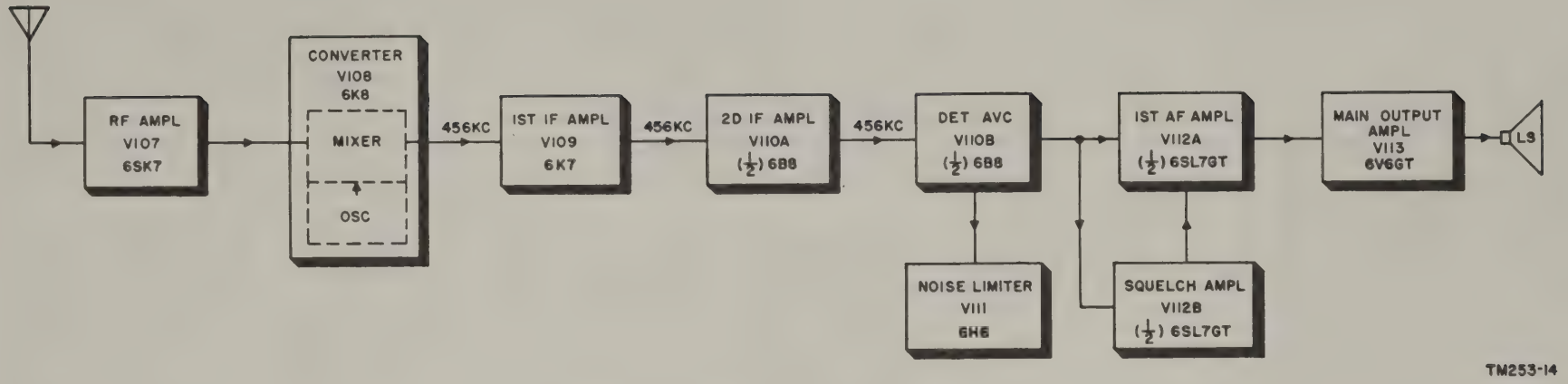


Figure 13. Receiver section, block diagram.

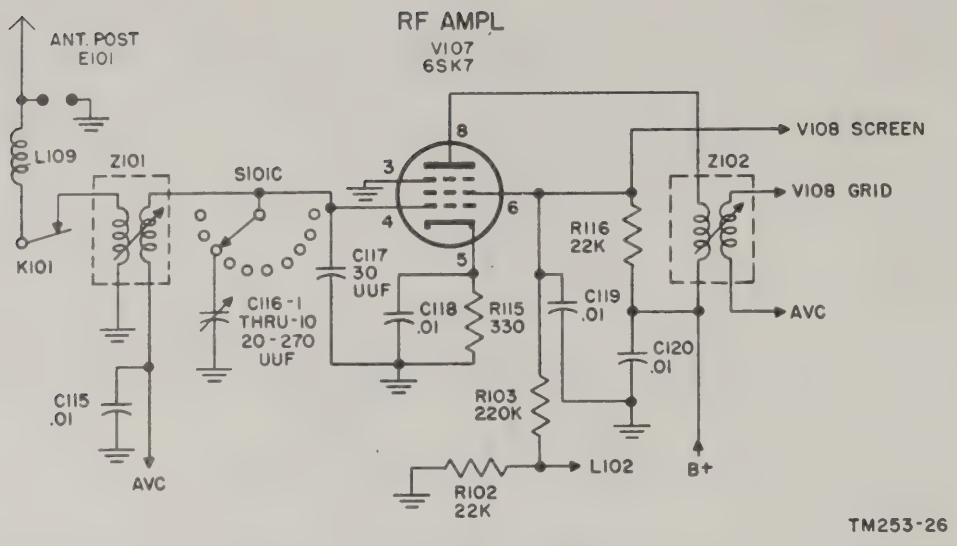


Figure 14. RF amplifier stage, schematic diagram.

46. Converter Stage

(fig. 15)

Converter V108 consists of two parts; the high-frequency crystal-controlled oscillator (triode) circuit operating at 456 kc above the signal frequency; and the mixer (hexode) portion which mixes the high-frequency oscillator voltage with the incoming signal.

a. The oscillator portion of the circuit (pins 8, 5, and 6) is a basic Pierce oscillator, in which the crystal serves as the feedback path from plate, pin 6, to grid, pin 5. Resistor R118 is the grid leak resistor and capacitor C125 bypasses oscillator feedback. Channel selector switch S101E selects the proper crystal from receiver crystals Y102-1 through 10. Injection of the high-frequency oscillator voltage to the mixer stage is accomplished by the grid of the oscillator section, pin 5, which is common with grid 1 of the mixer section. Plate voltage for the oscillator section is obtained through resistor R119. Bias for both sections is developed at the common cathode by resistor R117 and capacitor C124.

b. The RF output from the plate, pin 8, of V107 is coupled inductively to the secondary of Z102. The secondary is tuned to the operating frequency by fixed capacitor C122 in parallel with appropriate trimmer capacitor C123. Channel switch S101D selects the individual trimmer. Avc voltage is applied through R122 and the secondary of Z102 to the grid circuit of V108. Capacitor C121, in addition to bypassing radio frequency (rf), affects the time constant of the avc network in conjunction with R122. The signal voltage developed across the secondary of Z102 and tuned by C123 is applied to the control grid of converter tube V108. This RF signal is mixed with the local oscillator frequency (*a* above). The intermediate frequency of 456 kc appears at the hexode (mixer) plate, pin 3, and is delivered to the primary of first IF transformer Z103 which provides double-tuned plate-to-grid coupling to the first IF amplifier stage. Resistor R120 is the plate decoupler.

c. The screen, pin 4, of the mixer section is connected directly to the screen of RF amplifier V107 and receives its voltage through common dropping resistor R116 (fig. 14). *Remote cutoff* of the converter is required when the transmitter is operating. This is done by the impression of negative bias, through R103, from the buffer stage grid circuit (par. 53).

47. IF Amplifier Stages

(figs. 16 and 17)

a. First IF Amplifier. Interstage transformer Z103 is tuned to the IF (456 kc) by adjustable iron cores. The output voltage of first IF transformer Z103 is applied through the tube cap to the control grid of first IF amplifier tube V109. Screen (pin 4) voltage for V109 is obtained through resistor R120 which also applies the plate voltage for the mixer section of the previous stage. Capacitor C127 serves as V109 screen bypass. Resistor R121 is the cath-

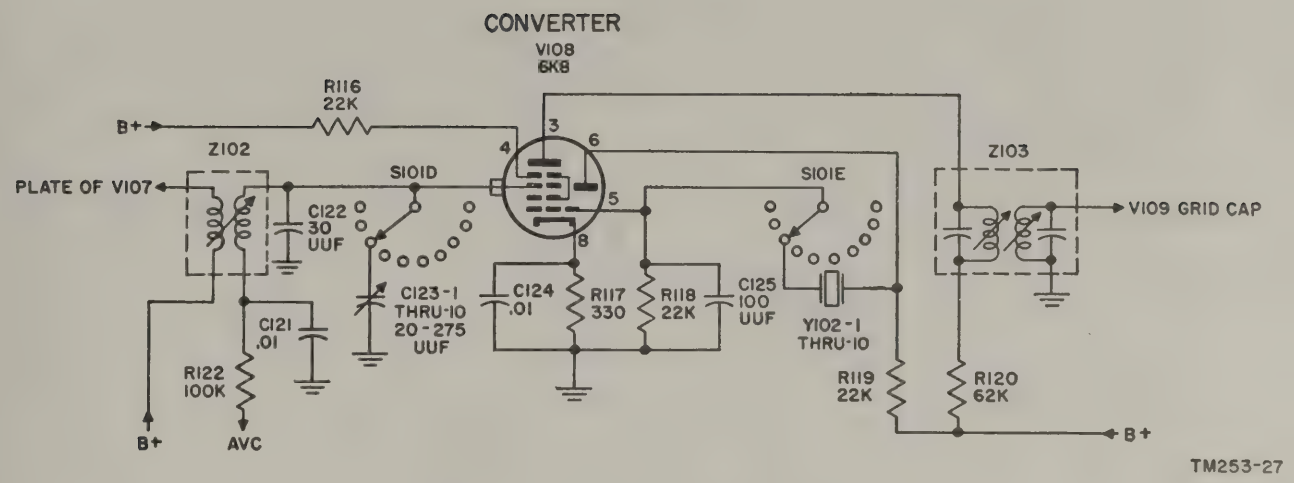


Figure 15. Converter stage, schematic diagram.

ode resistor; capacitor C128 bypasses the cathode resistor. Avc voltage is not applied to this stage. The grid is returned to ground through the secondary of Z103. The output, pin 3, of first IF amplifier tube V109 is applied to the primary of second IF transformer Z104. Capacitor C129 is the plate supply decoupling capacitor.

b. Second IF Amplifier. The output voltage of second IF transformer Z104 is applied through the tube cap to the control grid of second IF amplifier V110A. The second IF amplifier tube receives an avc voltage through isolating resistor R122 as does the mixer section of the converter stage. (par. 46). Capacitor C130 is the avc decoupling capacitor. The plate circuit is completed to the power supply through the primary winding of Z105 and decoupling resistor R125 which is bypassed for IF by C133. Screen voltage is obtained through dropping resistor R124 and the screen is bypassed by capacitor C132. The cathode is common to both the duodiode (par. 48) and pentode sections of V110. Resistor R123 is the cathode resistor; capacitor C131 is the cathode bypass. The output of the second IF amplifier is applied to the primary of output IF transformer Z105. As in the preceding interstage transformers, adjustable iron cores are used to tune each coil of Z105. The output of Z105 is fed to the diode detector circuit (par. 48).

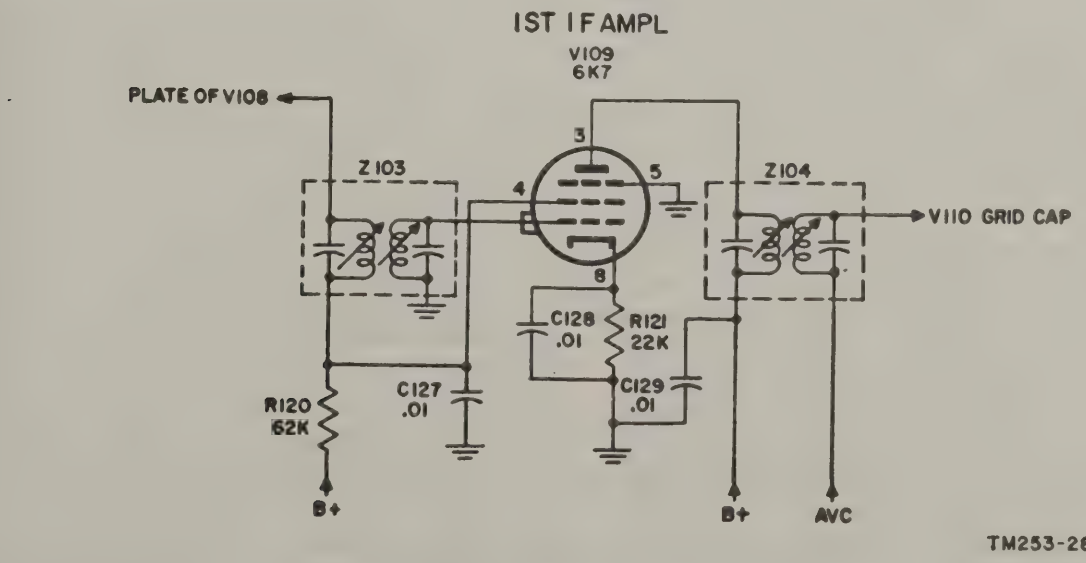


Figure 16. First IF amplifier stage, schematic diagram.

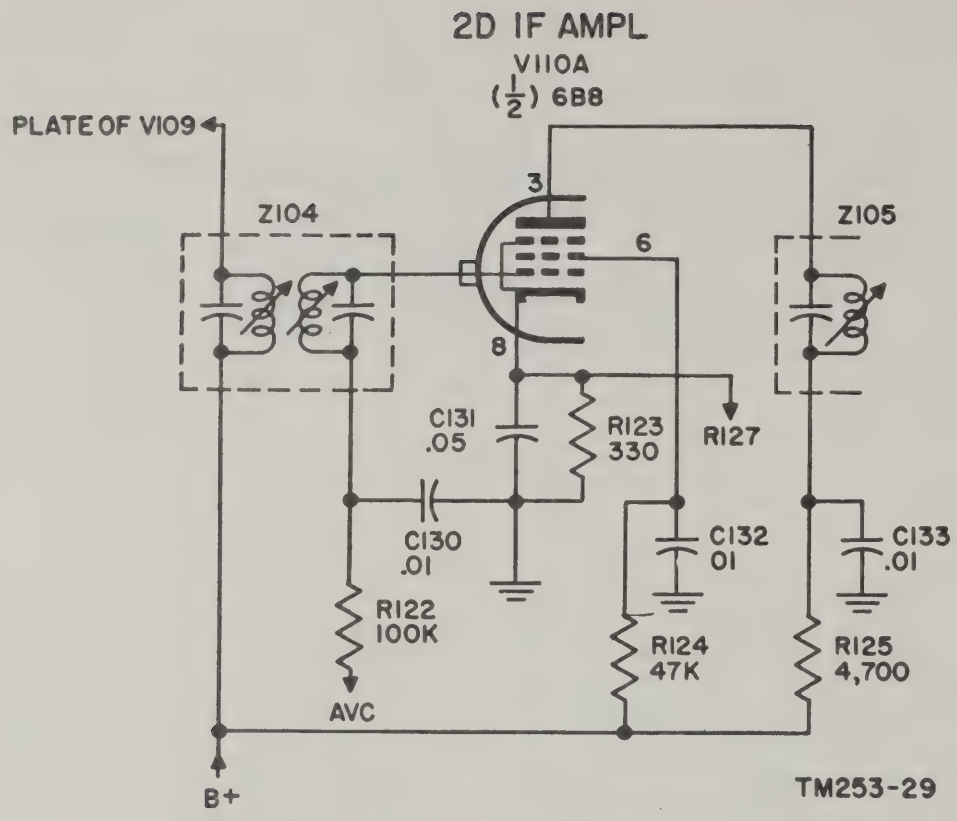


Figure 17. Second IF amplifier stage, schematic diagram.

48. Detector, Avc, and Noise Limiter Circuits

(fig. 18)

a. Detector. The secondary output of third IF transformer Z105 is applied to the twin plates, pins 4 and 5, of diode V110B. Resistors R126, R129, R128, and R127 in series constitute the diode load. Capacitors C134 and C135 provide RF filtering for the diode load. Avc voltage is developed across this load and is applied to controlled stages V107, V108, and V110A through resistor R131 from the junction of R126 and R129. Resistor R131 and bypass capacitor C137 filter the avc return circuit and remove audio fluctuations while permitting response to rapid input-signal amplitude changes. Diode V111B, connected between R131 and ground, provides a clamping action on the negative avc line. Under weak signal or no-signal conditions, when there is little or no avc voltage developed, the positive voltage at pin 8 of V110B developed across the cathode resistor is applied through R127, R128, R129, and R131 to pin 3 of V111. The diode then conducts, placing the plate and avc line at ground potential. The avc line can become negative but can never rise above ground potential. An avc bias can only be developed when the signal is of such a strength that current flows from the diode plates and external load back to the cathode of V110.

b. Noise Limiter. The voltage present at the junction of R126 and R129 is applied to the plate, pin 5, of noise limiter V111A. Resistor R130 and capacitor C136 form a resistance-capacitance network to bypass audio voltage at the plate. Operation of the noise limiter is controlled by SQUELCH switch S105 in the cathode lead, pin 8, of the automatic noise limiter (anl) section. The voltage present at the plate is negative, the audio voltage applied to the cathode is *positive* with respect to the plate. When a sudden voltage of high intensity, such as a noise peak or static burst is applied, the cathode is driven more negative and it is now *negative* with respect to the plate. (The plate voltage, because of the R130–C136 network, does not respond quickly to sudden voltage changes.) At that point, the tube conducts, effectively shorting R129, and bypassing the audio peaks at the

cathode through the tube and capacitor C136 to ground. Audio output voltage is taken from the junction of R127 and R128 and is supplied to the first AF amplifier and squelch circuits (par. 49 and fig. 19).

49. First Audio Amplifier and Squelch Circuits

(fig. 19)

a. First Audio Amplifier. Audio output voltage is delivered from the junction of R127 and R128 through either the REMOTE, PHONE, or SPKR position of switch S103F, and coupling capacitor C141 to VOLUME control R139. From the volume control, the audio voltage is fed to the control grid of V112A through coupling capacitor C140. Tube V112A is a conventional AF amplifier. Resistor R137 is the plate load resistor. Resistor R136, in series with the portion of potentiometer R133 between the tap and ground, is the cathode resistor bypassed by capacitor C139. Potentiometer R133 and R134 form a voltage divider across the B+ circuit. When the SQUELCH control is OFF (arm of potentiometer at ground), cathode resistor bias only is used. When the SQUELCH control is not OFF, a combination of fixed bias and cathode resistor bias is used. Output of this stage is coupled to the control grid, pin 5, of the AF output tube through coupling capacitor C142.

b. Squelch Circuit.

(1) When no signal is being received, there is no avc voltage and the tubes controlled by avc operate under high gain conditions. This results in reception of hash, motor noises, and static crashes. This noise, continuing through a period of monitoring, is annoying and undesirable. Squelch circuit V112B controls the operation of first audio amplifier V112A, and renders the stage inoperative when the input signal is not sufficient for normal reception.

(2) Control voltage for the squelch circuit is obtained at the junction of R127 and R128. This voltage is fed to the grid, pin 1, of the squelch section of V112B through an RC filter consisting of R132 and C138. This filter removes the audio component that is present and the voltage applied to the grid is independent of modulation. The squelch section is a voltage amplifier. Under no-signal conditions, the grid is positive (from voltage developed across cathode resistor R123 (fig. 18) of V110) and the tube conducts. Plate (pin 2) voltage is applied from B+ through resistor R134, SQUELCH control R133, and plate load resistor R135. The cathode, pin 3, completes the circuit to ground. When the tube conducts, plate current causes a voltage drop across plate resistor R135 which is effectively presented between the control grid, pin 4, and cathode, pin 6, of

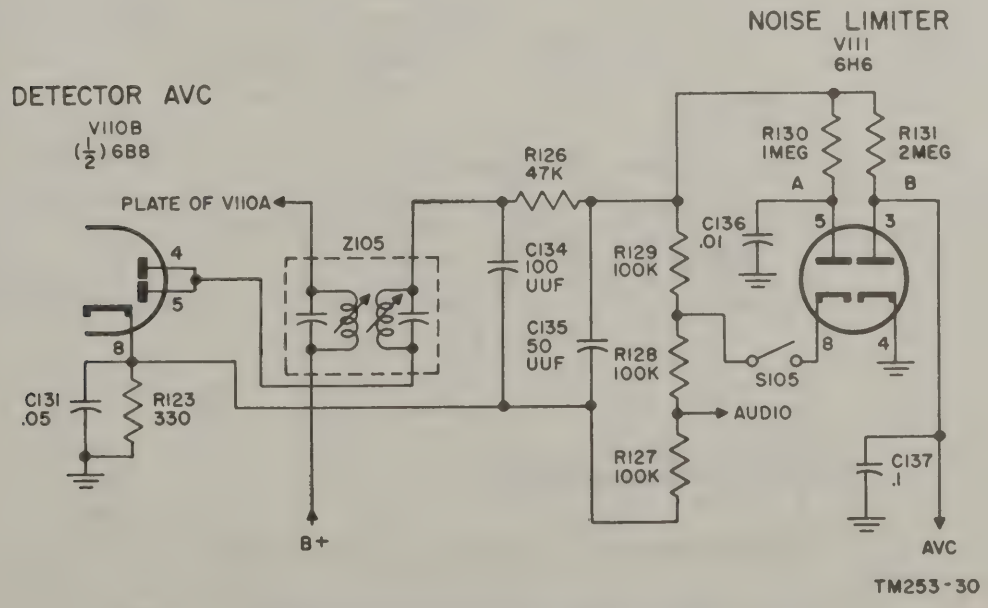


Figure 18. Detector, avc, and noise limiter circuits, schematic diagram.

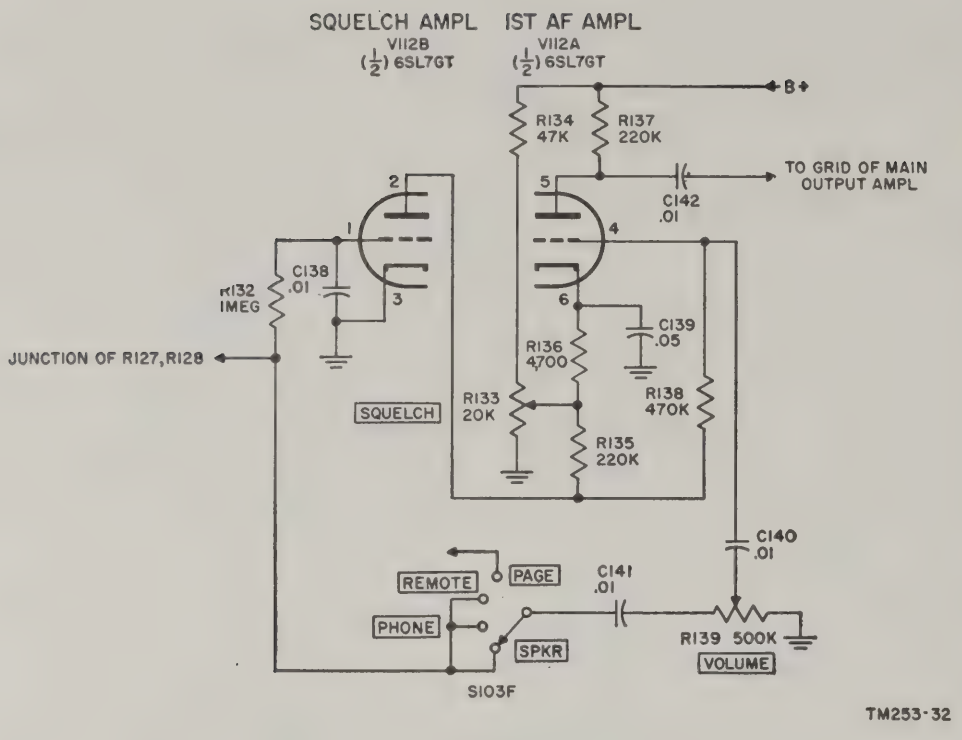


Figure 19. First AF amplifier and squelch circuit, schematic diagram.

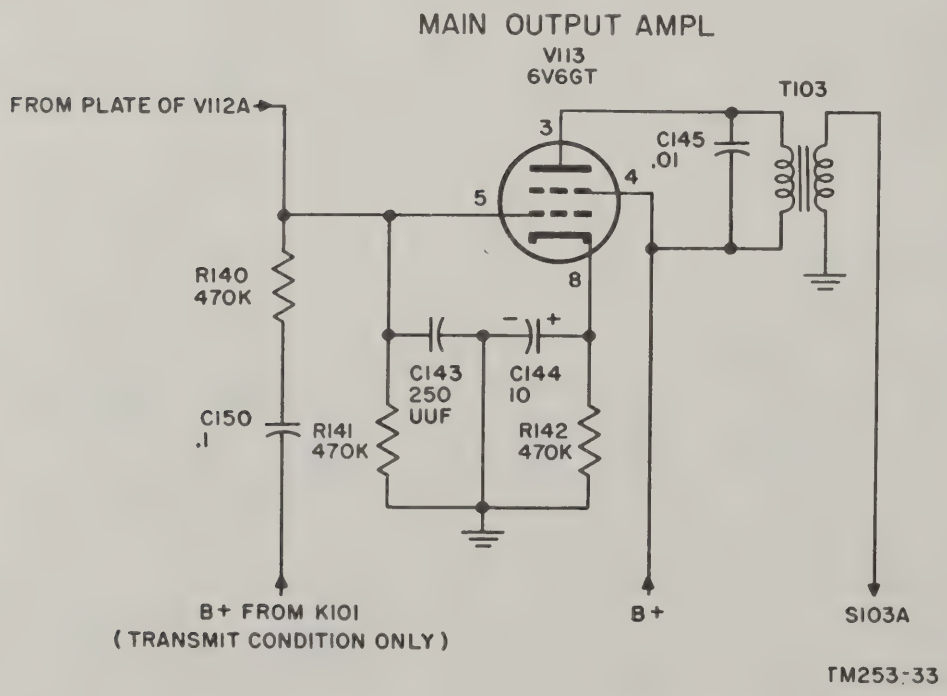


Figure 20. Main output amplifier stage, schematic diagram.

first audio amplifier V112A through grid resistor R138. This negative voltage on the grid of V112A biases it to cutoff and there is no audio output from the set. The setting of SQUELCH control R133 adjusts the B+ applied to V112B and the fixed bias applied to V112A (*a* above). The setting of R133 determines the level of audio signal required to cause first AF amplifier V112A to operate.

50. Main Output Amplifier Stage

(fig. 20)

Main output amplifier V113 is a 6V6GT beam power tube. Resistor R141 is the grid return resistor and is paralleled by C143 to prevent diode detection of RF that may be present in the grid circuit during transmission. Resistor R142 and electrolytic capacitor C144 provide cathode resistor bias. Resistor R140 and capacitor C150 provide a negative pulse of voltage to the control grid when switching from transmitting to receiving, and thereby suppress a transient pulse which might otherwise appear at the speaker. Audio output is coupled to the speaker through output transformer T103 connected across plate and screen of the stage. Capacitor C145 lowers the high-frequency response and helps eliminate high-frequency hash and transients accompanying the audio signal. Transformer T103 passes audio signals in the frequency range of 300 to 5,000 cycles. The audio signal is fed through OUTPUT switch section S103A to the speaker, local handset, or remote handset, depending on switch position.

Section II. TRANSMITTER SECTION

51. Block Diagram, Transmitter Section

(fig. 21)

The transmitter section consists of a crystal oscillator, buffer amplifier, power amplifier, and a modulator circuit. Oscillator tube V101 is frequency-controlled by a crystal as selected by the 10-position channel selector switch and supplies RF power to the grid circuit of buffer amplifier V102. The buffer amplifier amplifies the RF signal and drives the RF power amplifier stage. The stage also isolates the oscillator V101 from the power amplifier, V103 and V104, to prevent any variation of frequency which may be caused by loading of the power amplifier. The power amplifier stage consists of parallel tubes V103 and V104 which amplify the signal and deliver the modulated carrier to the antenna for radiation. The modulator circuit consists of push-pull tubes V105 and V106. It amplifies the audio signals from the handset and couples them to the power amplifier for modulation.

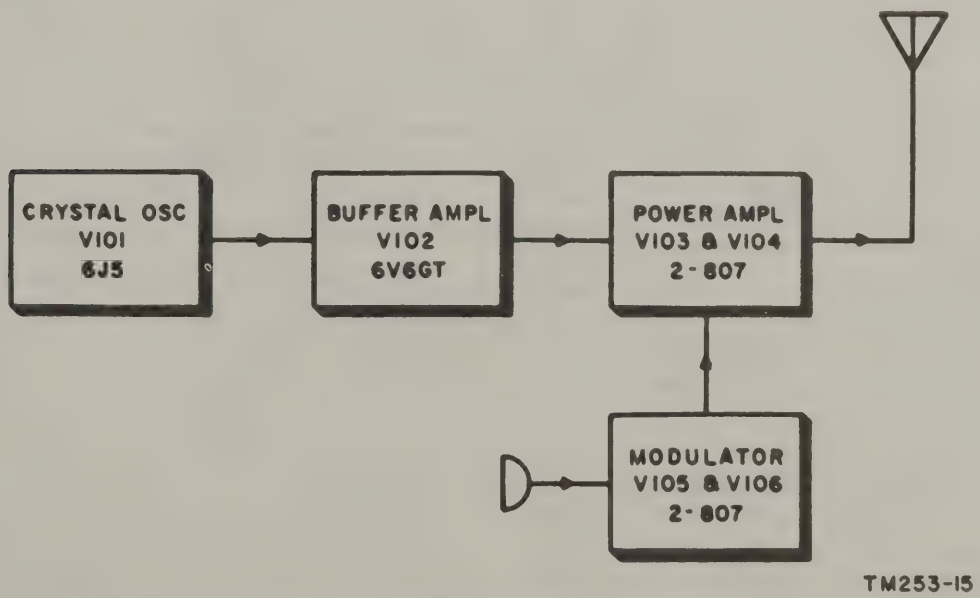


Figure 21. Transmitter section, block diagram.

52. Crystal Oscillator Stage

(fig. 22)

The crystal oscillator is a basic Pierce oscillator circuit with the crystal forming the plate-to-grid feedback circuit. The frequency of oscillation is predetermined by one of the 10 crystals (Y101–1–10) connected through channel selector switch S101A and S101B. The crystal acts as a series resonant circuit offering a very low impedance to the resonant frequency and a very high impedance to all others. Thus, only the desired frequency is fed back to the grid and oscillation occurs at the selected frequency. Grid leak resistor R101 and capacitor C101 connect from the grid to ground. Inductor L101 and capacitor C102 form a broadly resonant tank circuit for presenting a plate load to the oscillator stage. Capacitor C103 couples the RF output from the oscillator plate to the grid of buffer amplifier tube V102.

53. Buffer Amplifier

(fig. 23)

Buffer amplifier V102 operates under a self-biased condition obtaining bias from the voltage drops across grid resistor R102 and cathode resistor R104. Capacitor C104 is the cathode bypass capacitor. RF choke L102 presents a high impedance to RF, thus preventing loss of the RF signal through resistors R102 and R103. Capacitor C105 is the screen bypass capacitor. There is no screen-dropping resistor. Inductor L103 is the resonant component in the plate circuit supplying B+. Resistor R105 is in series with plate choke L103 to lower the Q of the composite circuit and broaden its resonance. Coupling capacitor C106 couples the RF output voltage to the control grids of the power amplifier tubes.

Note. Negative bias is generated across R102 when transmitting. This provides *remote cutoff,* through R103, of the RF amplifier and converter stages of the receiver section (pars. 45 and 46*c*).

54. Power Amplifier Stage and Antenna Tuning Circuit

a. Power Amplifier (fig. 24). The power amplifier stage uses two type 807 tubes, V103 and V104, operating in parallel. The control grids, pins 3, are directly connected. The tubes operate with a fixed negative grid bias obtained directly from B— through resistors R146 and R106. RF choke L104 isolates the incoming RF signal from the B— circuit. Pin jacks J103 and J104 are provided across R106 for measuring grid current. During measurement, R106 is bypassed. Its value, 470 ohms, is high enough to prevent causing inaccurate readings on grid current meters and low enough to avoid affecting the grid circuit. Pin jacks J101 and J102 are provided for measuring cathode current and resistor R107 serves the same purpose as R106 in the grid circuit. Capacitor C107 is the cathode bypass for R107. Resistors R108, R109, R110, and R111 in the plate and screen leads suppress parasitic oscillations that may arise in the pa stage.

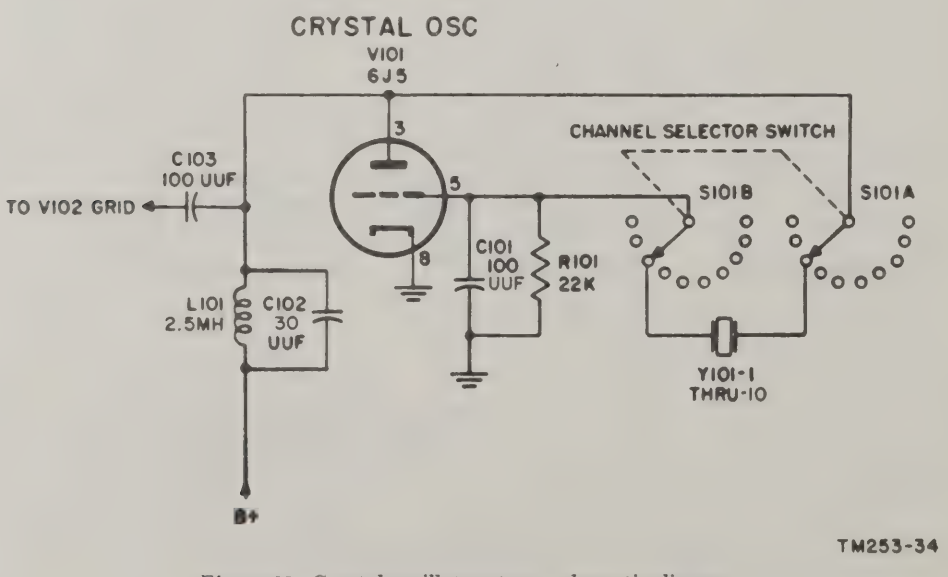


Figure 22. Crystal oscillator stage, schematic diagram.

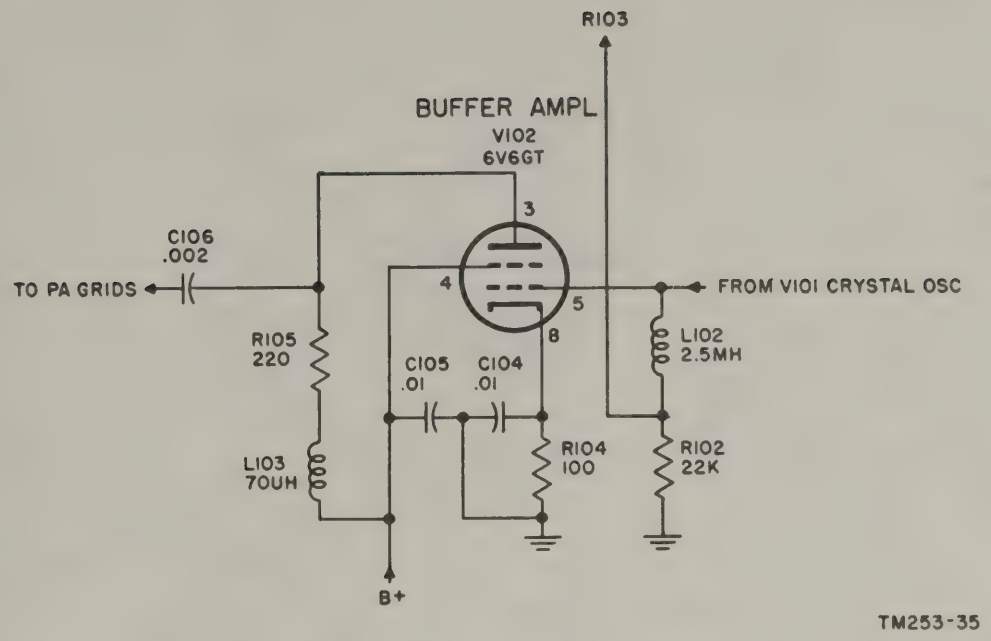


Figure 23. Buffer amplifier stage, schematic diagram.

Modulated screen voltage is obtained from the modulated B+ source through dropping resistor R112. Screen bypass capacitor C108 maintains the screens at RF ground potential. High-voltage B+ is supplied to the pa tubes through plate load RF choke L105. Inductor L105 isolates the RF output from the B+ circuit. Capacitor C109 couples the modulated RF path to the tank circuit. RF coil L106A, with ten-position switch S102B and capacitor C110, make up the pa plate tuning tank circuit. The RF signal is fed through C109 and the selected channel contact of S102B to the corresponding clip lead of tank coil L106A. Tuning of the tank circuit is by selection of coil taps and screwdriver adjustment of C110 (par. 17*d*). Inductor L106A and capacitor C110 are adjusted to resonance on each channel. Coupling link L106B feeds the output to the antenna tuning circuit.

b. Antenna Tuning (fig. 25). Coupling links L106B and L107B form a low impedance RF signal transfer circuit from L106A to L107A. RF coils L107A and L107B, with ten-position switch S102A and S102C and capacitor C111, make up the antenna loading and tuning circuit. The RF signal is connected from the junction of antenna tuning capacitor C111 and the fixed contact of S102C through the antenna switch contacts of changeover relay K101 and spark protection coil L109 to the antenna.

55. Modulator Stage

(fig. 26)

Audio signal voltage is generated in handset HS101 or at the remote handset and is presented through the black lead to terminal board TB101 or TB102. The audio is connected from the respective terminal on TB101 or TB102 through OUTPUT switch S103B to the primary of microphone transformer T101. The other side of the primary of T101 is connected to the junction of R144 and R145 in the B− voltage divider. The dc voltage developed across R145 is applied to the transformer and microphone through dropping resistor R113 and electrolytic capacitor C146, which provides the audio voltage return to ground. Audio signal output from the secondary of T101 is fed to the grids, pins 3, of push-pull modulator tubes V105 and V106 which operate in class AB1. The secondary of T101 is center tapped and fixed bias is obtained directly from B−. Screen voltage for the tubes is obtained from the low-voltage power supply through R147 and the high-voltage power supply through R148. Capacitor C149 is the screen bypass. Connection to the plates of V105 and V106 is made from each side of the primary (terminals 1 and 3) of T102. High voltage is supplied T102 at the center tap of the primary and to one end of the secondary. The amplified audio output from the modulator tubes is coupled to the power

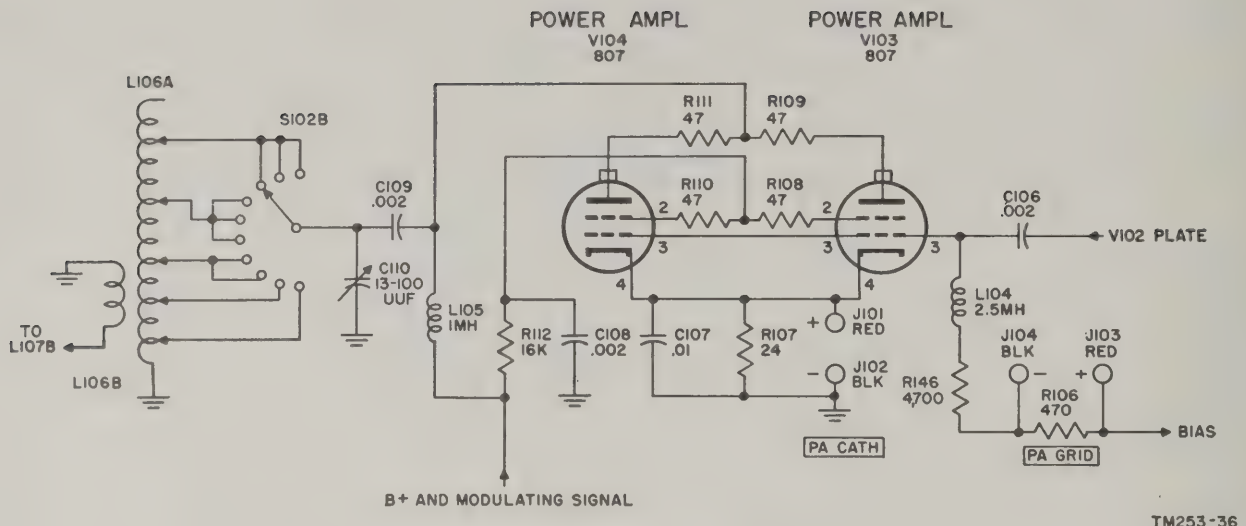


Figure 24. Power amplifier stage, schematic diagram.

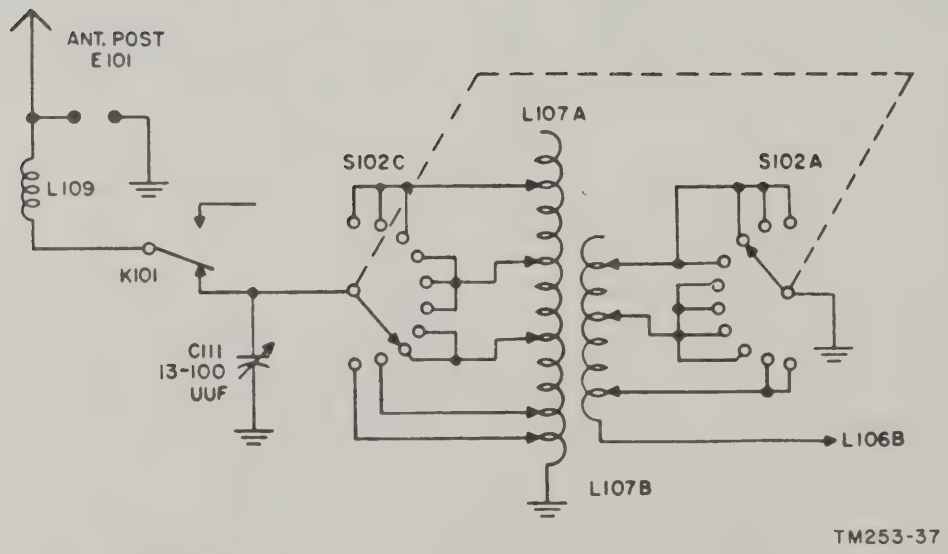


Figure 25. Antenna loading and tuning circuit, schematic diagram.

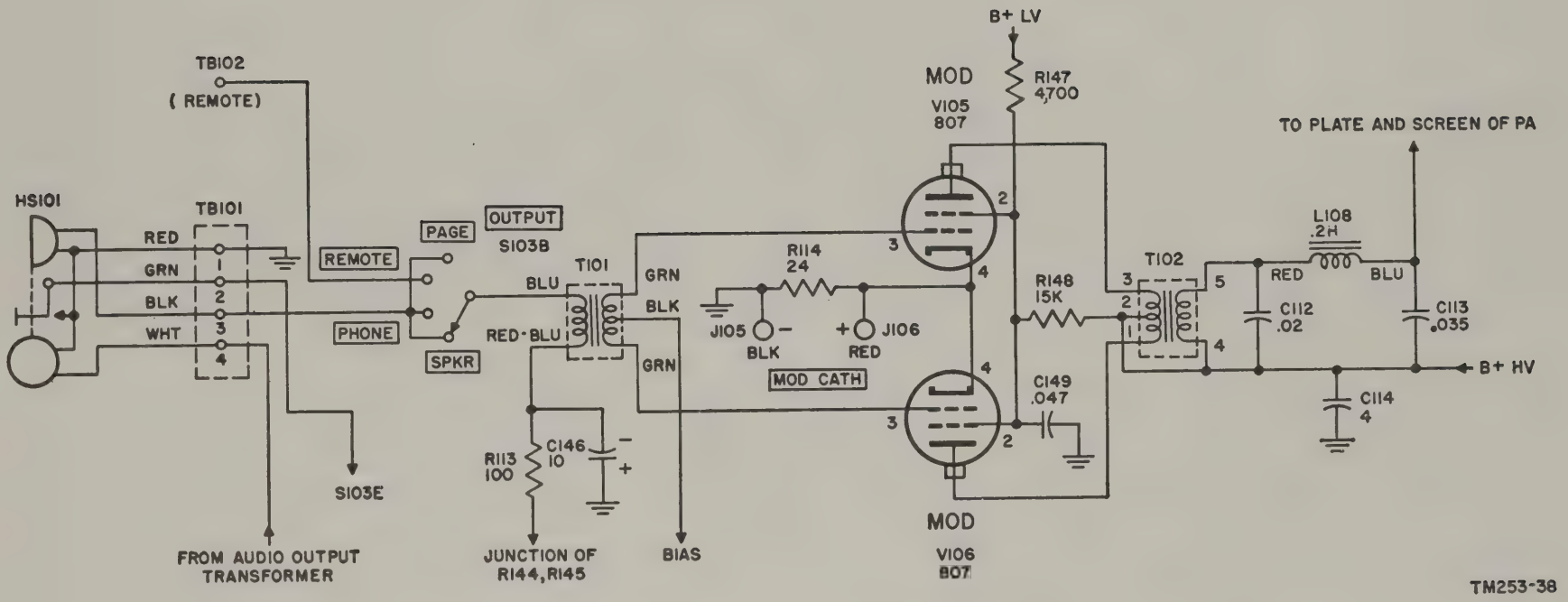


Figure 26. Modulator stage, schematic diagram.

amplifier stage through modulation transformer T102 and a low pass filter network. The low pass filter network is formed by inductor L108 and capacitors C112, C113, and C114. This network attenuates audio frequencies above 4,000 cycles, thereby limiting the transmitter bandwidth. Pin jacks J105 and J106 are provided for measuring modulator cathode current of V105 and V106. Resistor R114 is used to complete the cathode circuit to ground when a meter is not used. Its value, 24 ohms, is high enough to prevent inaccuracy in meter reading and low enough to avoid affecting plate current.

Section III. POWER SUPPLIES

56. Power Supply and Control Circuits of Radio Sets AN/SRC–8 and AN/SRC–8AZ

(fig. 27)

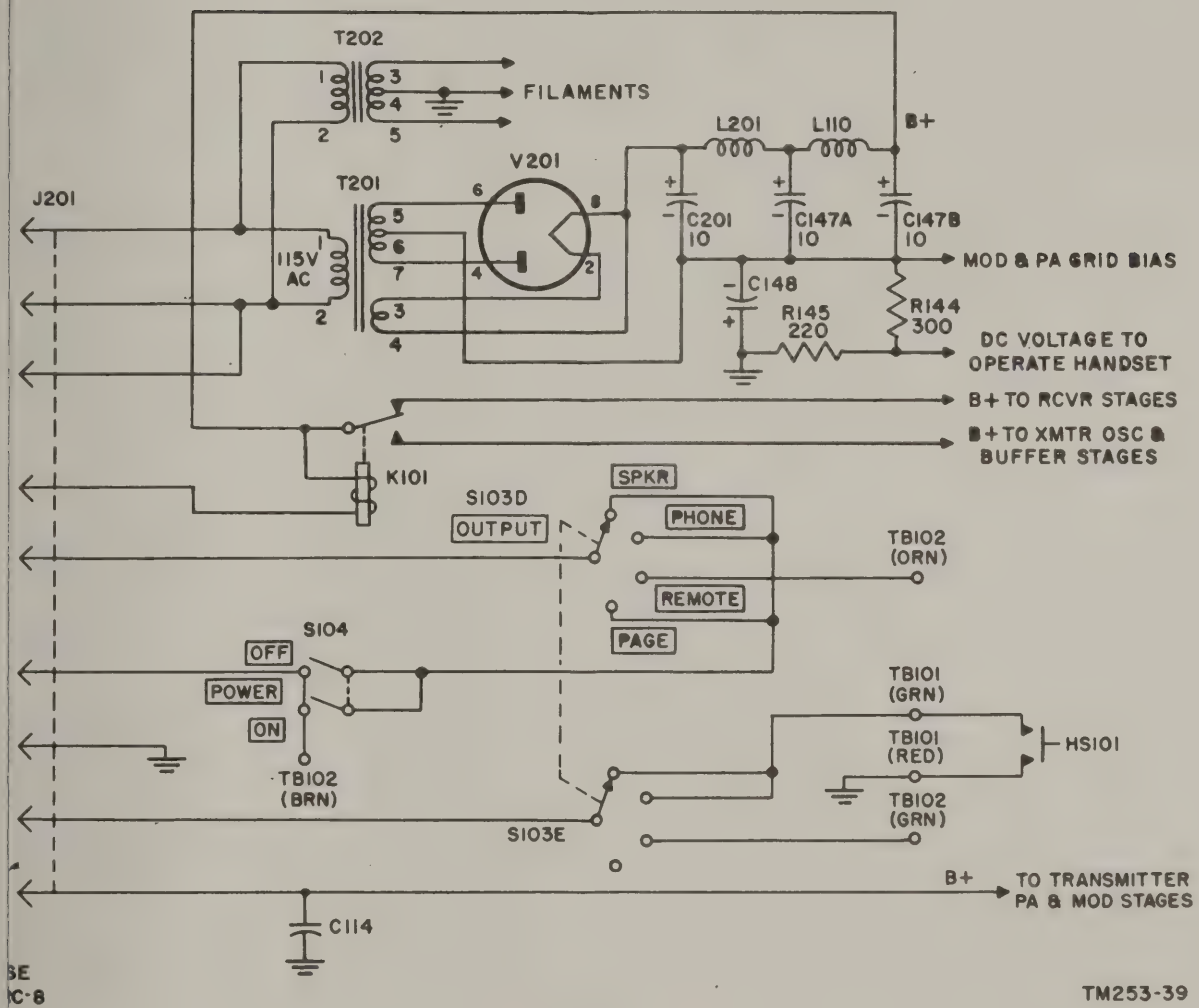
Radio Sets AN/SRC–8 and AN/SRC–8AZ each use Radio Receiver-Transmitter RT–306A/SRC–8 with different converter-dynamotor units. Converter-Dynamotor PU–283A/SRC–8 is used with 115-volt dc input; Converter-Dynamotor CV–522/SRC–8 is used with 24-volt dc input. The control circuits and reference symbols of components in the converter-dynamotors are the same. The following discussion applies to both units.

a. The input source of each converter-dynamotor is connected to terminal board TB401. From TB401 the negative lead connects to the corresponding negative brushes of inverter D401 and dynamotor D402, and the positive lead to contacts of relay K402 and contacts and coil of K401.

b. Relay K401 is the master power contactor and is energized by the POWER switch of the receiver-transmitter or remote control unit. The circuit from the other terminal of the K401 coil is through terminal 5 of TB402, Electrical Special Purpose Cable Assembly CX–3761/SRC–8, switch S103D in SPKR, PHONE, or PAGE position, and POWER switch S104 back through the power cable and 6 of TB402 to the negative terminal of the power supply. When S103D is in the REMOTE position, the circuit is completed to TB102 (orange) through the remote cable and the POWER switch at the remote unit. The brown wire in the remote cable connects back to the negative of the power supply. With relay K401 energized, inverter D401 operates, providing 115 volts alternating current (ac) at terminals 2, and 3 and 4 of TB402 through fuse F401.

c. From TB402, 115 volts ac is applied to input receptacle J201 at parallel terminals 3 and 4 and terminal 2 through the power cable. The ac is directly connected to the primary of filament transformer T202 and power transformer T201. Capacitors C202 and C203 (fig. 41) bypass the ac line to ground. Filament transformer T202 secondary provides 6.3 volts ac at each side of the center tap (terminal 4) for the tube filaments. Twelve-volt panel lamp DS101 is connected across the total secondary (terminals 3 and 5). Power transformer T201 has two secondaries; terminals 3 and 4 provide 5 volts for the filament of rectifier tube V201 and terminals 5, 6, and 7 provide center tapped high voltage which is applied to the plates of V201 in a conventional full wave rectifier circuit. The rectified dc output obtained between the center tap (terminal 6) of T201 and filament (pin 8) of V201 is filtered by the two section filter consisting of filter reactors L201 and L110 in series with the B+ lead, and capacitors C147A, C147B, and C201 returning to the negative lead. Resistors R144 and R145 form a voltage divider connected in series from the negative side to ground to provide a source of dc voltage for the microphone at the junction of R144 and R145. Bias voltage for the modulator and pa stages is obtained by connecting their grids to B— and connecting the cathodes to ground. Capacitor C148 is connected across the B— lead to ground. The positive 250-volt dc output obtained at the junction of C147B and L110 is switched by the movable contact of K101 between the receiver stages and the transmitter oscillator and buffer stages. Operation of relay K101 is discussed in *d* below.

d. With inverter D401 in operation, B+ from the electronic power supply of the receiver-transmitter is applied to the coil and one arm of antenna transfer relay K101. The coil of antenna transfer relay K101 is connected in series with the coil of power relay K402 in the converter-dynamotor to the push button on handset HS101 in the receiver-transmitter. When OUTPUT switch S103E is set to the REMOTE position, the circuit is completed to



Z power supplies, schematic diagram.

amplifier stage through modulation transformer T102 and a low pass filter network. The low pass filter network is formed by inductor L108 and capacitors C112, C113, and C114. This network attenuates audio frequencies above 4,000 cycles, thereby limiting the transmitter bandwidth. Pin jacks J105 and J106 are provided for measuring modulator cathode current of V105 and V106. Resistor R114 is used to complete the cathode circuit to ground when a meter is not used. Its value, 24 ohms, is high enough to prevent inaccuracy in meter reading and low enough to avoid affecting plate current.

Section III. POWER SUPPLIES

56. Power Supply and Control Circuits of Radio Sets AN/SRC–8 and AN/SRC–8AZ

(fig. 27)

Radio Sets AN/SRC–8 and AN/SRC–8AZ each use Radio Receiver-Transmitter RT–306A/SRC–8 with different converter-dynamotor units. Converter-Dynamotor PU–283A/SRC–8 is used with 115-volt dc input; Converter-Dynamotor CV–522/SRC–8 is used with 24-volt dc input. The control circuits and reference symbols of components in the converter-dynamotors are the same. The following discussion applies to both units.

a. The input source of each converter-dynamotor is connected to terminal board TB401. From TB401 the negative lead connects to the corresponding negative brushes of inverter D401 and dynamotor D402, and the positive lead to contacts of relay K402 and contacts and coil of K401.

b. Relay K401 is the master power contactor and is energized by the POWER switch of the receiver-transmitter or remote control unit. The circuit from the other terminal of the K401 coil is through terminal 5 of TB402, Electrical Special Purpose Cable Assembly CX–3761/SRC–8, switch S103D in SPKR, PHONE, or PAGE position, and POWER switch S104 back through the power cable and 6 of TB402 to the negative terminal of the power supply. When S103D is in the REMOTE position, the circuit is completed to TB102 (orange) through the remote cable and the POWER switch at the remote unit. The brown wire in the remote cable connects back to the negative of the power supply. With relay K401 energized, inverter D401 operates, providing 115 volts alternating current (ac) at terminals 2, and 3 and 4 of TB402 through fuse F401.

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d. With inverter D401 in operation, B+ from the electronic power supply of the receiver-transmitter is applied to the coil and one arm of antenna transfer relay K101. The coil of antenna transfer relay K101 is connected in series with the coil of power relay K402 in the converter-dynamotor to the push button on handset HS101 in the receiver-transmitter. When OUTPUT switch S103E is set to the REMOTE position, the circuit is completed to

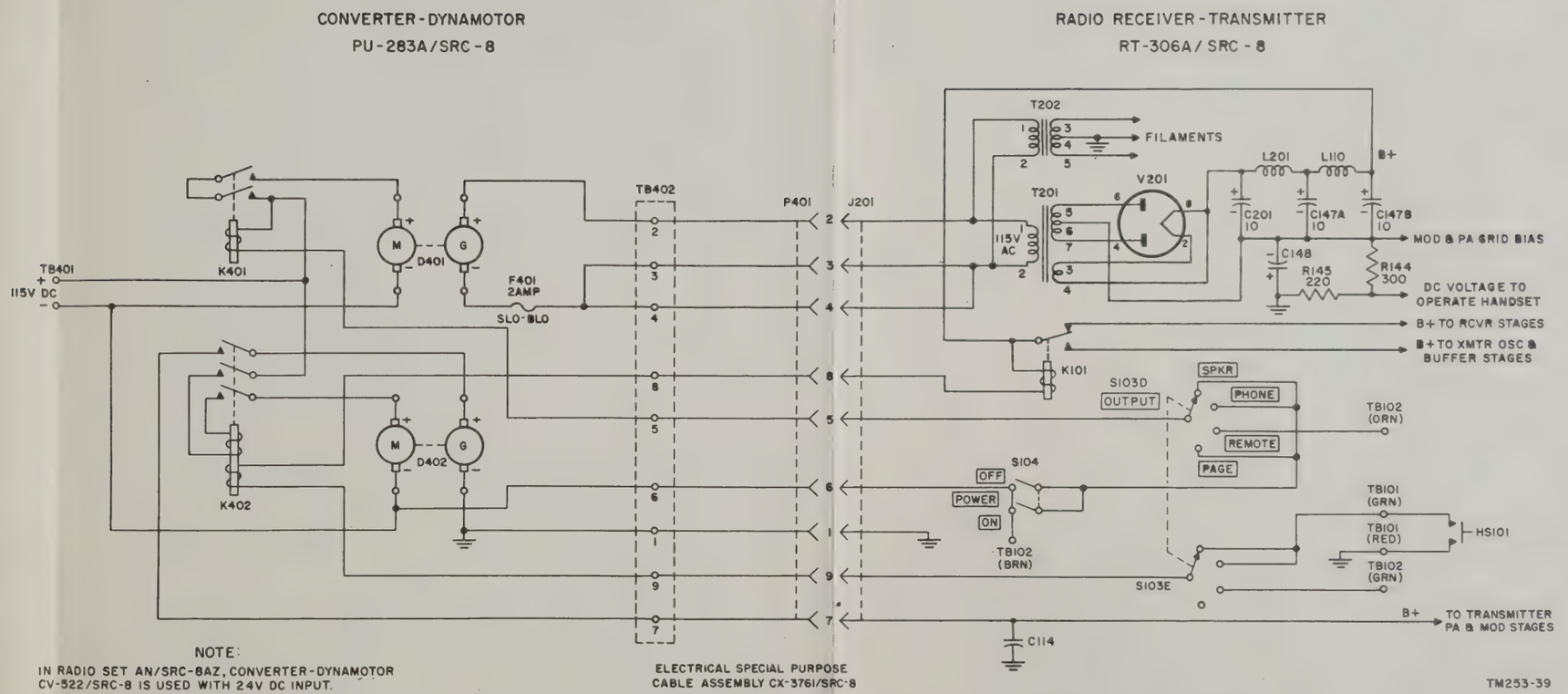


Figure 27. Radio Sets AN/SRC–8 and AN/SRC–8AZ power supplies, schematic diagram.

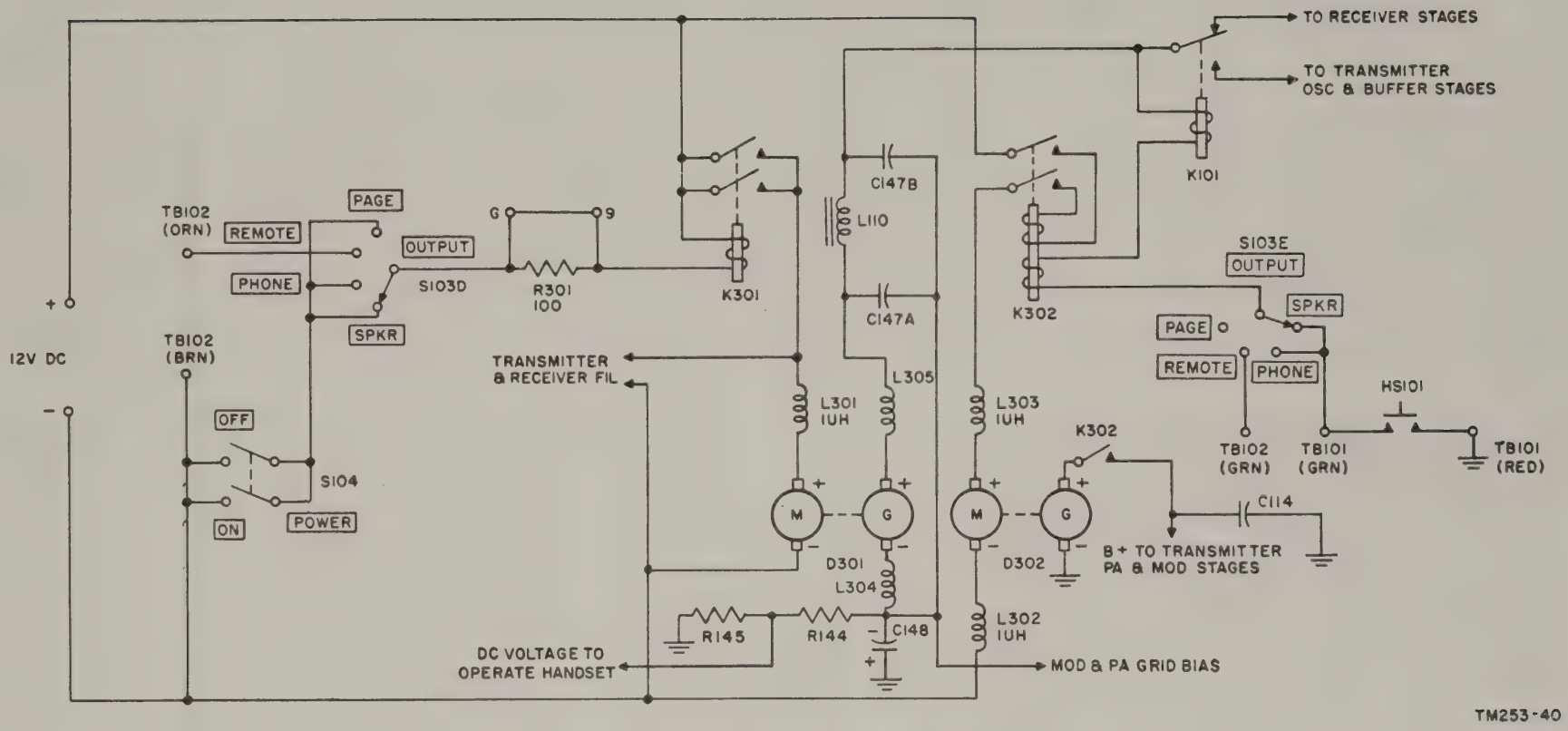


Figure 28. Radio set AN/SRC-8XX power supply, schematic diagram.

TB102 (green) and through the remote cable to the POWER switch (fig. 12) and the handset button on the remote control handset. The other side of each of the handset push buttons is grounded. When the push button on the handset HS101 is pressed, the relay coils are connected across the B+ supply energizing relays K101 and K402. Relay K101 in addition to switching the 250-volt plate supply (*c* above), transfers the antenna connection from the RF input stage of the receiver to the transmitter output circuit. Relay K402 applies 115 volts dc to dynamotor D402 through an additional aiding winding on the relay that holds the relay closed during the high-current starting period. This is provided to prevent arcing of contacts if the handset push button is released immediately after depressing. The output of dynamotor D402 (650 volts dc) is applied to terminal 7 of TB402 through a pair of contacts on relay K402. This extra contact removes high voltage to the transmitter the moment K402 is released. The 650 volts at terminal 7 of J201 is connected directly to the modulator and pa stages as shown in figures 24 and 26.

57. Power Supply and Control Circuits of Radio Set AN/SRC–8XX

(fig. 28)

a. The positive lead of the 12-volt dc input is connected to a contact of K302 and a contact and coil of K301. The negative lead is connected to the negative brushes of dynamotors D301 and D302.

b. POWER switch S104 operates relay K301 when the OUTPUT switch is in any position except REMOTE. In the REMOTE position, the circuit is completed to TB102 (orange) and to the POWER switch at the remote control. When relay K301 is energized the circuit is completed to dynamotor D301, to the indicator lamp DS101, and to the filament circuit (fig. 42). Output voltage from D301 is filtered of "hash" by RF chokes L304 and L305. "Hash" generated at the motor section of D301 is suppressed by choke L301 and capacitors C303 and C304.

c. The 250-volt dc output is connected through capacitor-input filter C147A, L110, C147B to the movable contact and the coil of relay K101. The movable contact of K101 completes the B+ circuits to the plate and screen circuits of the receiver stages. When K101 is energized the B+ is supplied to the oscillator and buffer stages of the transmitter section. The negative output of the dynamotor is connected to ground through a B– voltage divider consisting of R144 and R145. Bias for the pa and modulator stages is obtained by connecting B– of the dynamotor to the control grids (fig. 24, 26) and completing the cathode circuits to ground. Dc operating voltage for the microphone is obtained from the junction of R144 and R145.

d. With dynamotor D301 in operation, B+ is applied to the coil and one arm of K101. Relay K101 and relay K302 are controlled by the push button in handset HS101. These coils are in series and, through S103E in SPKR or PHONE position and the handset button, are grounded. When S103E is in the REMOTE position the circuit is completed to TB102 (green) and the remote cable to the POWER switch (fig. 12) and handset button at the remote control unit. Relay K101, in addition to switching the 250-volt plate supply (*c* above), transfers the antenna connection from the RF input stage of the receiver to the transmitter output circuit. Relay K302 activates dynamotor D302 which supplies high voltage to the transmitter pa and modulator. A special series winding is provided on relay K302 to help hold the relay closed during the high-input current condition and thereby prevent arcing at the points. This could occur when the dynamotor is activated and deactivated immediately. The 650-volt dc output of D302 is completed through contacts of K302 to the pa and modulator stage. This contact serves the function of instantly disconnecting the dc voltage while the dynamotor coasts to a stop as the handset button is released.

Section IV. INTERUNIT CIRCUITS WITH RADIO SET CONTROL C–1429A/SRC–8

58. Remote Control

a. With OUTPUT switch S103 in the REMOTE position, the remote control unit has command of the radio set. POWER switch S501 in the remote control unit (pars. 56*b*, 57*b* and fig. 12) takes over the function of the receiver-transmitter POWER switch and the push button on handset HS501 takes over the function of the push button on handset HS101 as described in paragraphs 56*d* and 57*d*.

Note. Remote control is limited by the fact that channel

selection must be done at the receiver-transmitter and the maximum volume at the remote control speaker is limited by the VOLUME control setting at the receiver-transmitter.

b. Audio output at the remote handset is supplied through the remote cable to TB102 (black). From this terminal the audio output is applied through S103B (REMOTE position) to transformer T101 in the modulator grid circuit. Audio output from the receiver is passed through S103A to TB102 (white) through the remote cable to the speaker or handset earpiece at the remote unit.

59. Paging System

Paging operation (deck callings) allows the operator at the receiver-transmitter to speak directly to the remote control location.

Caution: Operation of the receiver-transmitter in the PAGE position without a remote control connected to the receiver-transmitter can cause damage to the equipment.

With the OUTPUT switch in the PAGE position, the black lead from local handset HS101 is connected to microphone input transformer T101 through the contacts of S103B. The secondary voltage is developed across one half of the secondary of the transformer and is connected through the contacts of OUTPUT switch S103F, coupling capacitor C141, and the VOLUME control to the first audio amplifier. The output voltage from the audio output transformer is connected to the white terminal of terminal board TB102 through the contacts of OUTPUT switch S103A. The audio voltage is connected to the remote control VOLUME control R502 through the white lead of the remote cable and through the VOLUME control to the loudspeaker. The person being called cannot answer; the remote facility cannot be used for intercom work.

CHAPTER 7

FIELD MAINTENANCE

Section I. TROUBLESHOOTING AT FIELD MAINTENANCE LEVEL

Note. This chapter contains field maintenance instructions. The amount of repair that can be performed by units having field maintenance responsibility is limited only by the tools and test equipment available and the skill of the repairman.

60. General Instructions

Troubleshooting at field maintenance level includes all the techniques outlined for organizational maintenance and any special or additional techniques required to isolate a defective part: These procedures are not complete in themselves but supplement the procedures described in organizational maintenance. The systematic troubleshooting procedure, which begins with the operational checks performed at an organizational level, must be completed by sectionalizing, localizing and isolating techniques.

61. Troubleshooting Procedures

a. General. To be effective, troubleshooting must be systematic. Generally it will be necessary to perform a *sequence* of operational checks, observations, and measurements before a fault will be revealed. The trouble will be traced first to a unit. then to a portion of the unit, and finally to the defective part. Some faults, such as burned-out resistors and arcs can often be located by sight, smell, and hearing. The majority of faults, however, must be localized by checking voltage and resistance. The sequence of steps is referred to as the sectionalization, localization, and isolation of trouble.

b. Sectionalization. When an abnormal indication is obtained while using the equipment performance checklist (par. 35) or operational checks in paragraph 66 it can be used as an aid in sectionalizing trouble to the unit.

(1) If both the receiver and transmitter are poor in performance, check the voltage of the power source.

(2) If the receiver operates normally but the transmitter fails to perform on any channel, investigate the performance of transmitter relays, dynamotor, and tubes.

(3) If the transmitter operates normally but the receiver fails on all channels, inspect the receiver output circuits and tubes.

(4) If any one channel fails to operate on either transmitter or receiver, check the crystal, channel tuning, and switch contacts.

c. Localization. The tests and procedures listed below will aid in isolating the trouble. First, localize the trouble to a single stage or circuit, and then isolate the trouble within that circuit by voltage, resistance, and continuity measurements. Use the following methods of trouble localization:

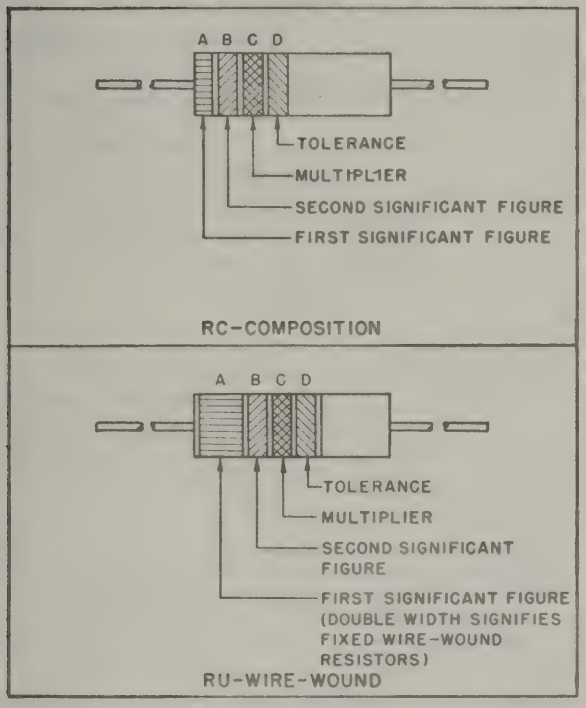
(1) *Troubleshooting chart* (par. 67*e* (receiver), par. 68 (transmitter)). The trouble symptoms listed in the chart will aid in localizing trouble to a specific stage.

(2) *Signal substitution and stage gain measurements* (par. 67). Signal substitution procedures enable the repairman to localize total and severe failures quickly to a stage. In conjunction with stage gain measurements, hard-to-find troubles and weak operation are quickly localized.

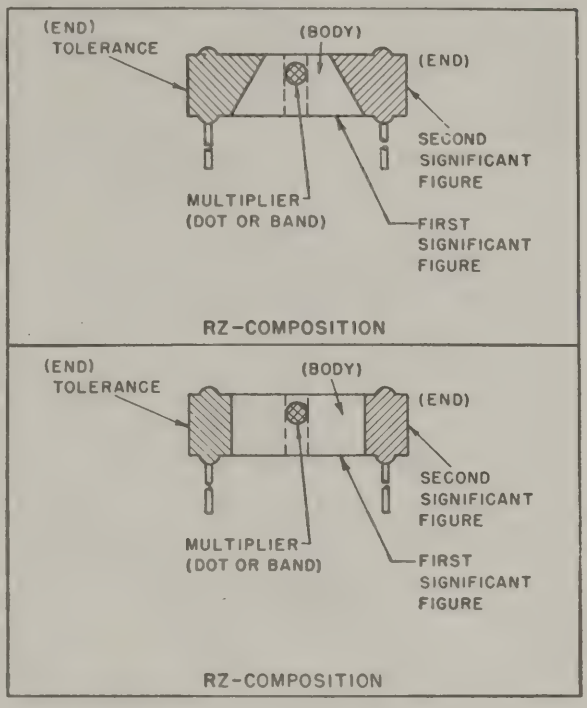
(3) *Voltage and resistance measurements.* These measurements help locate the individual component at fault. Use resistor and capacitor color codes (figs. 29 and 30) to find the value of the components. Use

RESISTOR COLOR CODE MARKING
(MIL-STD RESISTORS)

AXIAL-LEAD RESISTORS (INSULATED)



RADIAL-LEAD RESISTORS (UNINSULATED)



RESISTOR COLOR CODE

BAND A OR BODY*		BAND B OR END*		BAND C OR DOT OR BAND*		BAND D OR END*	
COLOR	FIRST SIGNIFICANT FIGURE	COLOR	SECOND SIGNIFICANT FIGURE	COLOR	MULTIPLIER	COLOR	RESISTANCE TOLERANCE (PERCENT)
BLACK	0	BLACK	0	BLACK	1	BODY	± 20
BROWN	1	BROWN	1	BROWN	10	SILVER	± 10
RED	2	RED	2	RED	100	GOLD	± 5
ORANGE	3	ORANGE	3	ORANGE	1,000		
YELLOW	4	YELLOW	4	YELLOW	10,000		
GREEN	5	GREEN	5	GREEN	100,000		
BLUE	6	BLUE	6	BLUE	1,000,000		
PURPLE (VIOLET)	7	PURPLE (VIOLET)	7				
GRAY	8	GRAY	8	GOLD	0.1		
WHITE	9	WHITE	9	SILVER	0.01		

*FOR WIRE-WOUND-TYPE RESISTORS, BAND A SHALL BE DOUBLE-WIDTH. WHEN BODY COLOR IS THE SAME AS THE DOT (OR BAND) OR END COLOR, THE COLORS ARE DIFFERENTIATED BY SHADE, GLOSS, OR OTHER MEANS.

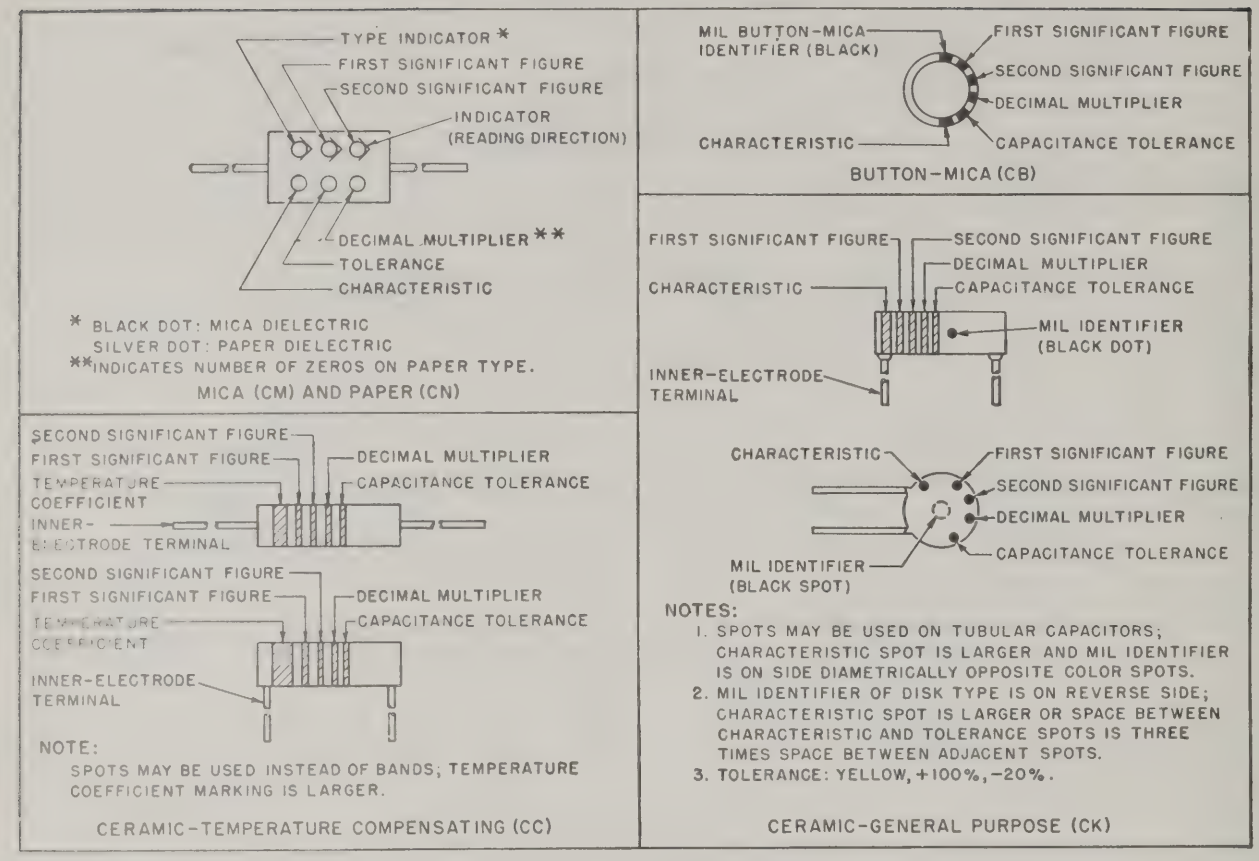
EXAMPLES (BAND MARKING):
10 OHMS ±20 PERCENT: BROWN BAND A; BLACK BAND B; BLACK BAND C; NO BAND D.
4.7 OHMS ±5 PERCENT: YELLOW BAND A; PURPLE BAND B; GOLD BAND C; GOLD BAND D.

EXAMPLES (BODY MARKING):
10 OHMS ±20 PERCENT: BROWN BODY; BLACK END; BLACK DOT OR BAND; BODY COLOR ON TOLERANCE END.
3,000 OHMS ±10 PERCENT: ORANGE BODY, BLACK END; RED DOT OR BAND; SILVER END.

STD-RI

Figure 29. Resistor color codes.

CAPACITOR COLOR CODE MARKING
(MIL-STD CAPACITORS)



CAPACITOR COLOR CODE

COLOR	SIG FIG.	MULTIPLIER		CHARACTERISTIC[1]				TOLERANCE [2]					TEMPERATURE COEFFICIENT (UUF/UF/°C)
		DECIMAL	NUMBER OF ZEROS	CM	CN	CB	CK	CM	CN	CB	CC		
											OVER 10UUF	10UUF OR LESS	CC
BLACK	0	1	NONE		A			20	20	20	20	2	ZERO
BROWN	1	10	1	B	E	B	W				1		-30
RED	2	100	2	C	H		X	2		2	2		-80
ORANGE	3	1,000	3	D	J	D			30				-150
YELLOW	4	10,000	4	E	P								-220
GREEN	5		5	F	R						5	0.5	-330
BLUE	6		6		S								-470
PURPLE (VIOLET)	7		7		T	W							-750
GRAY	8		8			X						0.25	+30
WHITE	9		9								10	1	-330(±500) [3]
GOLD		0.1						5		5			+100
SILVER		0.01						10	10	10			

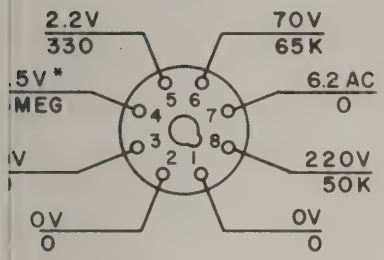
1. LETTERS ARE IN TYPE DESIGNATIONS GIVEN IN MIL-C SPECIFICATIONS.
2. IN PERCENT, EXCEPT IN UUF FOR CC-TYPE CAPACITORS OF 10 UUF OR LESS.
3. INTENDED FOR USE IN CIRCUITS NOT REQUIRING COMPENSATION.

STD-CI

Figure 30. Capacitor color codes.

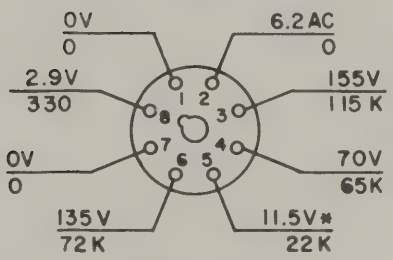
RF AMPL

V107
6SK7



CONVERTER

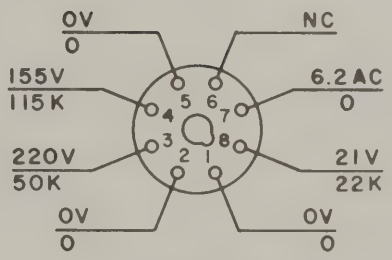
V108
6K8



TUBE CAP
−.44V*
2.4 MEG

IST I F AMPL

V109
6K7



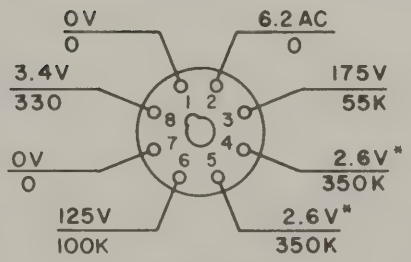
TUBE CAP
0V
13

TER

0V
0
−.5V*
2.3MEG
0V
0
2.6V*
.3MEG

2D IF AMPL, DET, AVC

V110
6B8



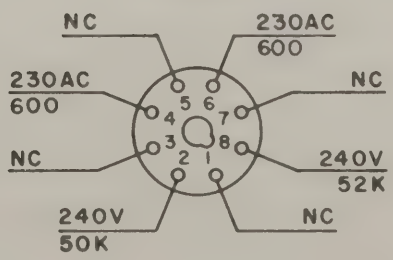
TUBE CAP
−.44V*
2.4 MEG

F AMPL

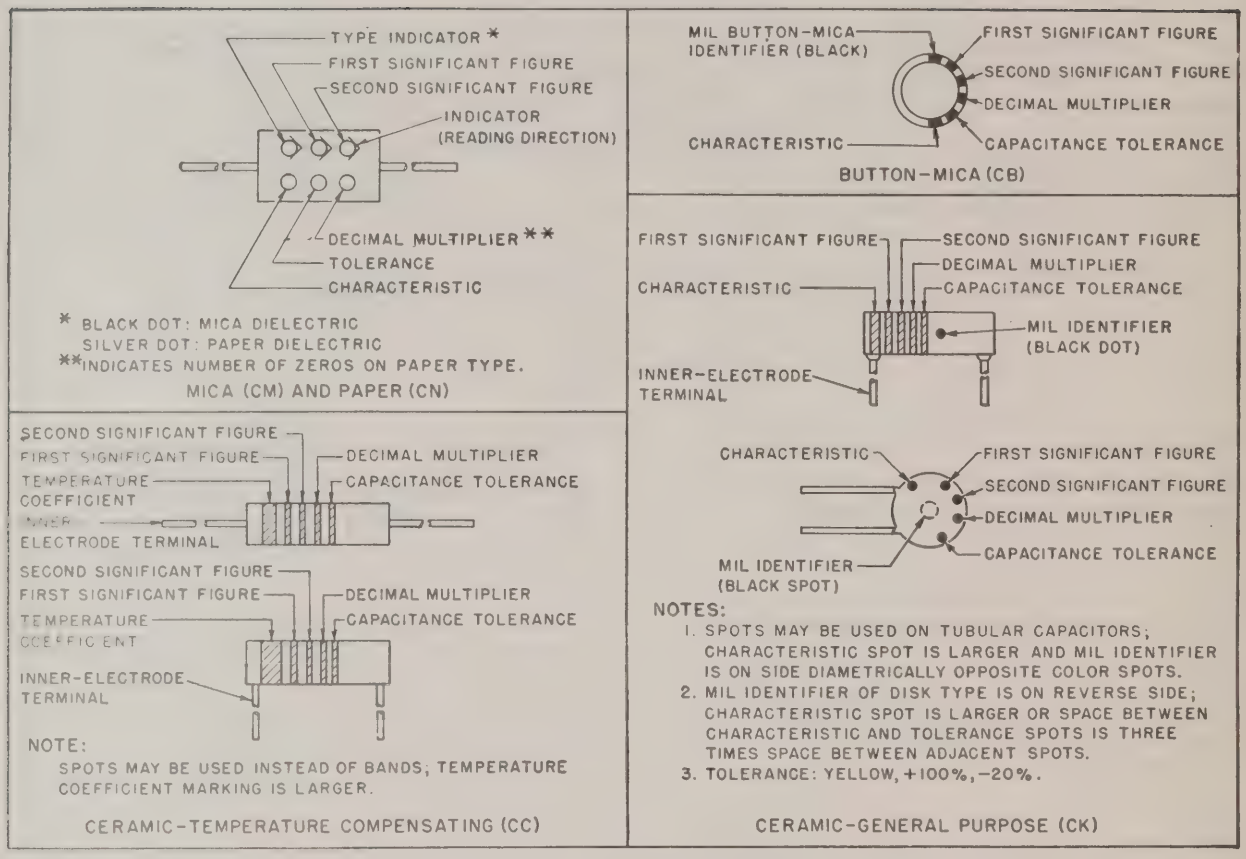
1.6V**
4.7K***
6.2 AC
0
0V
0
−.75V*
1.1MEG

RECT

V201
5Y3GT



CAPACITOR COLOR CODE MARKING
(MIL-STD CAPACITORS)



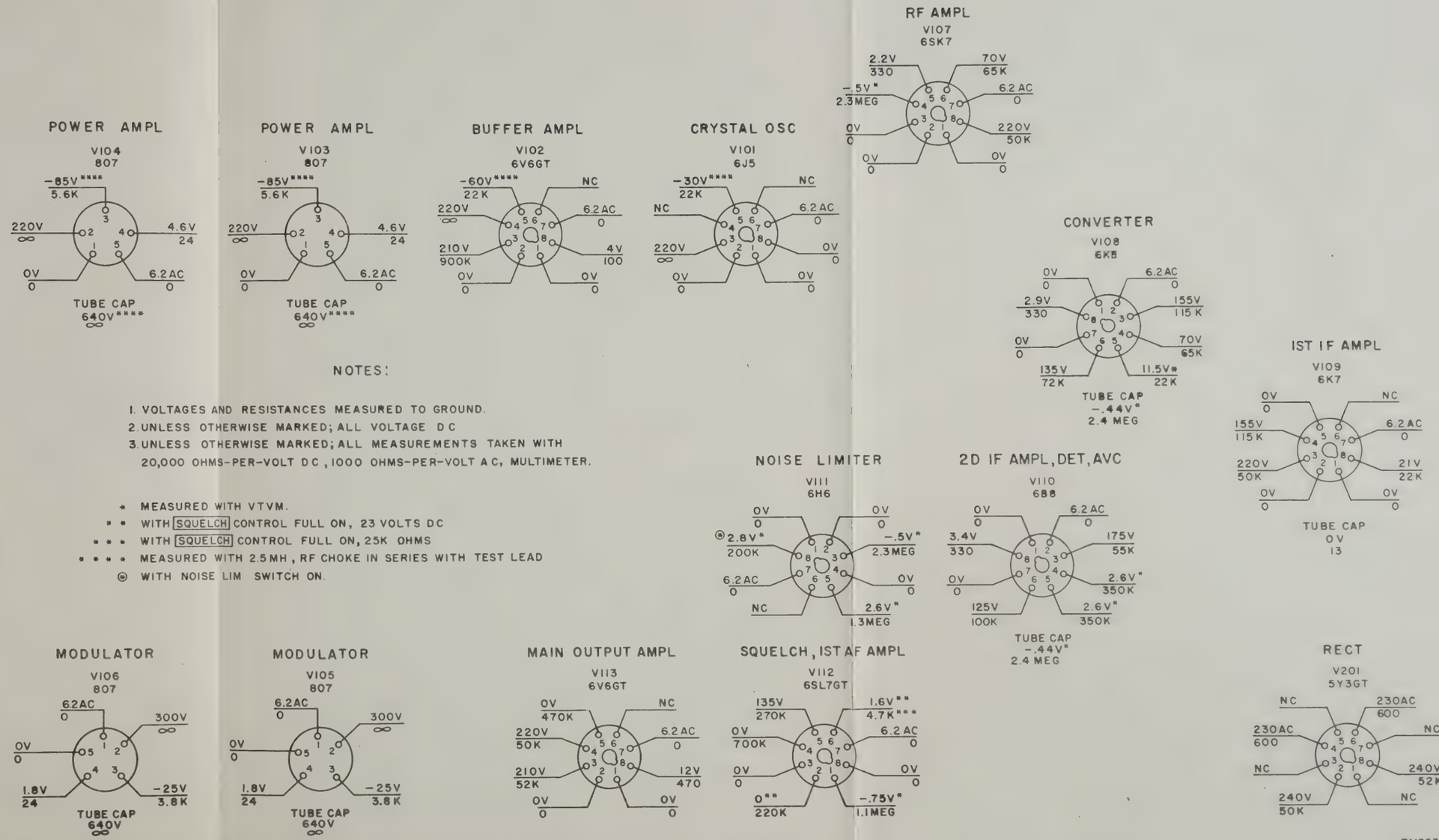
CAPACITOR COLOR CODE

COLOR	SIG FIG.	MULTIPLIER		CHARACTERISTIC[1]				TOLERANCE[2]					TEMPERATURE COEFFICIENT (UUF/UF/°C)
		DECIMAL	NUMBER OF ZEROS	CM	CN	CB	CK	CM	CN	CB	CC		
											OVER 10UUF	10UUF OR LESS	CC
BLACK	0	1	NONE		A			20	20	20	20	2	ZERO
BROWN	1	10	1	B	E	B	W				1		-30
RED	2	100	2	C	H		X	2		2	2		-80
ORANGE	3	1,000	3	D	J	D			30				-150
YELLOW	4	10,000	4	E	P								-220
GREEN	5		5	F	R						5	0.5	-330
BLUE	6		6		S								-470
PURPLE (VIOLET)	7		7		T	W							-750
GRAY	8		8			X						0.25	+30
WHITE	9		9								10	1	-330(±500)[3]
GOLD		0.1						5		5			+100
SILVER		0.01						10	10	10			

1. LETTERS ARE IN TYPE DESIGNATIONS GIVEN IN MIL-C SPECIFICATIONS.
2. IN PERCENT, EXCEPT IN UUF FOR CC-TYPE CAPACITORS OF 10 UUF OR LESS.
3. INTENDED FOR USE IN CIRCUITS NOT REQUIRING COMPENSATION.

STD-CI

Figure 30. Capacitor color codes.



NOTES:

1. VOLTAGES AND RESISTANCES MEASURED TO GROUND.
2. UNLESS OTHERWISE MARKED; ALL VOLTAGE D C
3. UNLESS OTHERWISE MARKED; ALL MEASUREMENTS TAKEN WITH 20,000 OHMS-PER-VOLT D C, 1000 OHMS-PER-VOLT A C, MULTIMETER.

* MEASURED WITH VTVM.
* * WITH [SQUELCH] CONTROL FULL ON, 23 VOLTS DC
* * * WITH [SQUELCH] CONTROL FULL ON, 25K OHMS
* * * * MEASURED WITH 2.5 MH, RF CHOKE IN SERIES WITH TEST LEAD
⊛ WITH NOISE LIM SWITCH ON.

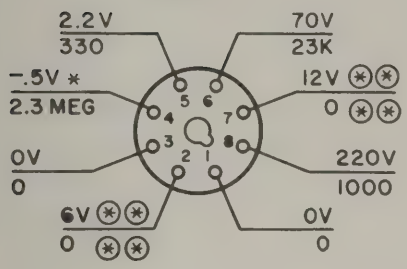
205-003 O - 65 (5720-A) Face p. 48 No. 1

Figure 31. Radio Receiver-Transmitter RT-306A/SRC-8 (part of Radio Sets AN/SRC-8 and AN/SRC-8AZ), voltage and resistance diagram.

TM253-17

RF AMPL

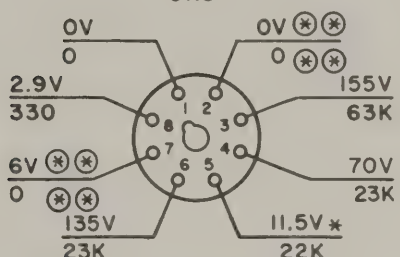
V107
6SK7



⊛
⊛
0V
0

CONVERTER

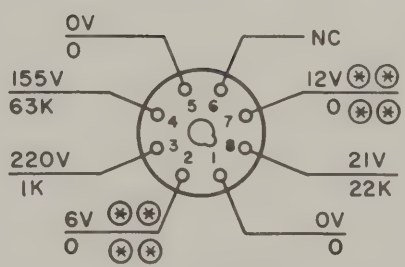
V108
6K8



TUBE CAP
-.44V *
2.4 MEG

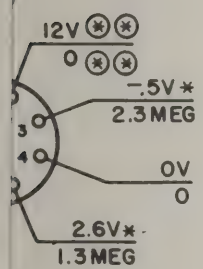
IST IF AMPL

V109
6K7



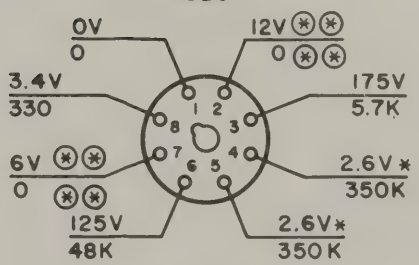
TUBE CAP
0V
13

MITER



2D IF AMPL, DET, AVC

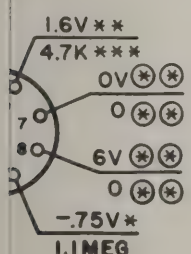
V110
6B8

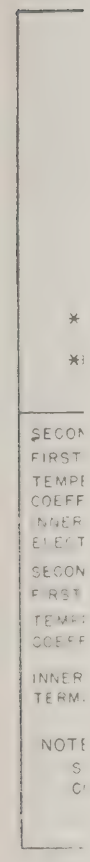


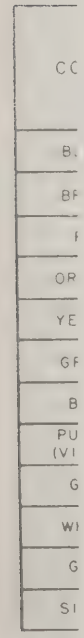
TUBE CAP
-.44V *
2.4MEG

T AF AMPL

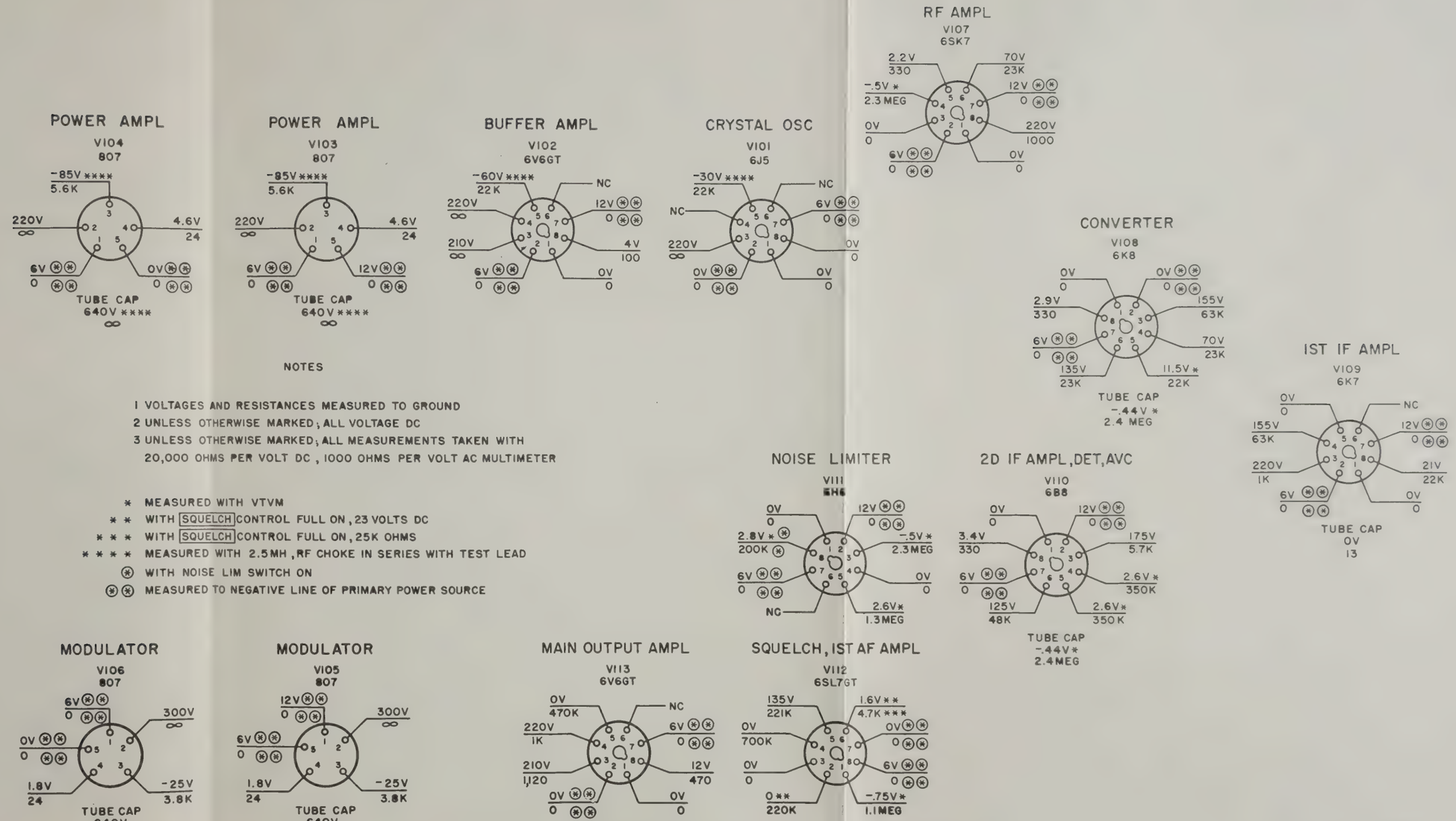
GT







1 LET
2 IN
3. INT



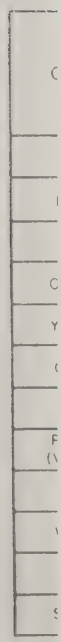
NOTES

1 VOLTAGES AND RESISTANCES MEASURED TO GROUND
2 UNLESS OTHERWISE MARKED; ALL VOLTAGE DC
3 UNLESS OTHERWISE MARKED; ALL MEASUREMENTS TAKEN WITH 20,000 OHMS PER VOLT DC, 1000 OHMS PER VOLT AC MULTIMETER

* MEASURED WITH VTVM
** WITH SQUELCH CONTROL FULL ON, 23 VOLTS DC
*** WITH SQUELCH CONTROL FULL ON, 25K OHMS
**** MEASURED WITH 2.5MH, RF CHOKE IN SERIES WITH TEST LEAD
⊛ WITH NOISE LIM SWITCH ON
⊛⊛ MEASURED TO NEGATIVE LINE OF PRIMARY POWER SOURCE

Figure 32. Radio Receiver-Transmitter RT-327A/SRC-8XX (part of Radio Set AN/SRC-8XX), voltage and resistance diagram.

205-003 O - 65 (5720-A) Face p. 48 No. 2



1. LE
2. IN
3. IN

voltage and resistance diagrams in figure 31 and 32 and paragraphs 64, 65, and 69 to find normal readings, and compare them with readings obtained in troubleshooting.

(4) *Intermittent troubles.* In all these tests, the possibility of intermittent troubles should not be overlooked. If present, this type of trouble often may be made to appear by tapping or jarring the equipment.

Test equipment	Common name
Signal Generator AN/URM–25	Signal generator
Tube Tester TV–7/U	Tube tester
Electronic Multimeter TS–505/U	Vtvm
Audio Oscillator TS–382A/U	Audio oscillator
Multimeter TS–352/U	Multimeter
.05 μf 600-volt dc capacitor	
200-μμf capacitor	

62. Test Equipment Required for Troubleshooting

The test equipment required for troubleshooting the radio set is listed below. A common usage name is indicated after each piece of equipment.

63. General Precautions

a. If the nature of the trouble is not known through visual inspection of components and wiring (par. 33) be sure the faulty condition is not a short circuit. Continued operation under shorted conditions can cause damage to the radio set.

b. If the transmitter section is faulty, check the RF power amplifier tuning (par. 17). Prolonged transmitter operation under detuned conditions can burn out the power amplifier tubes.

c. Care should be exercised in working around antenna tuning and leading coils L106 and L107. The leads are attached to these coils by special

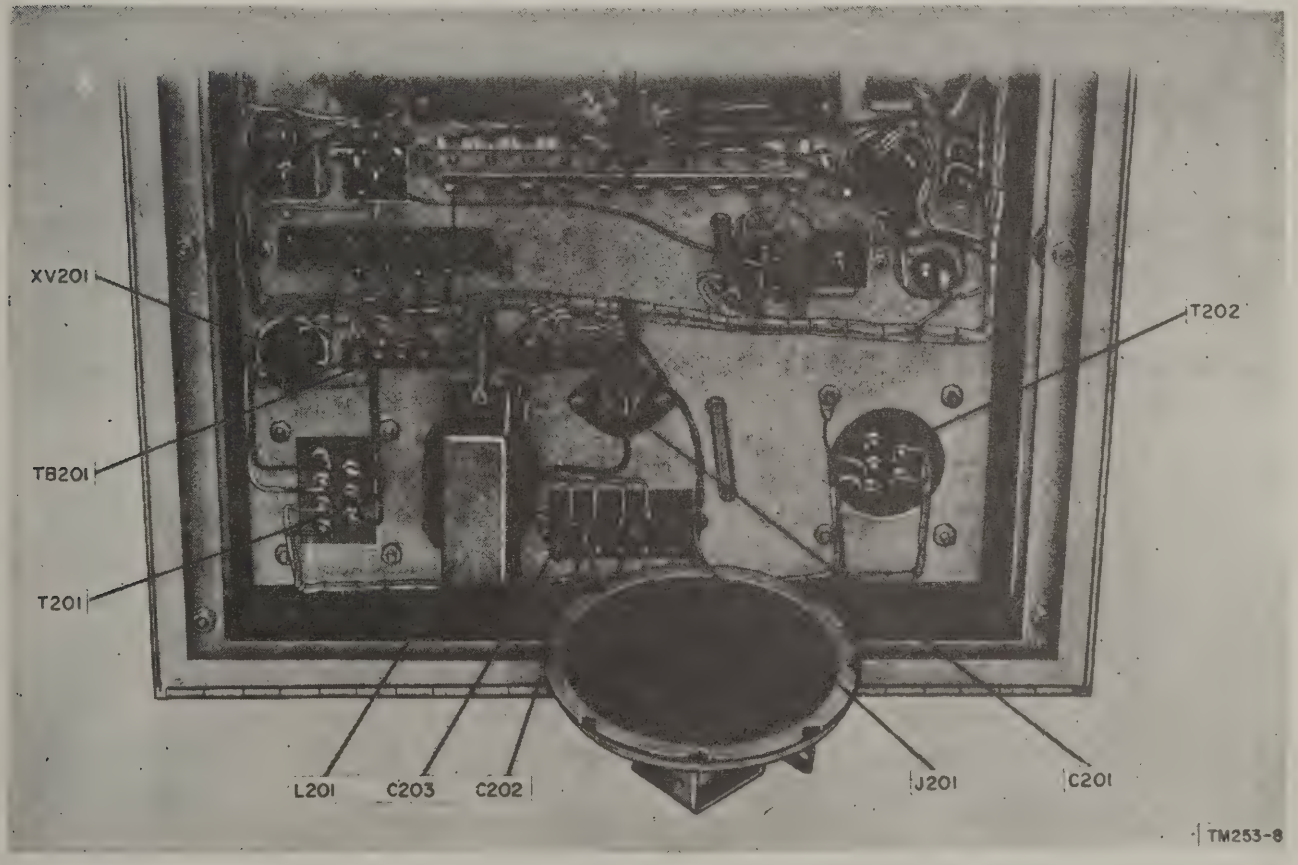


Figure 33. Radio receiver-transmitter RT–306A/SRC–8, lower front of chassis showing low-voltage B+ power supply components.

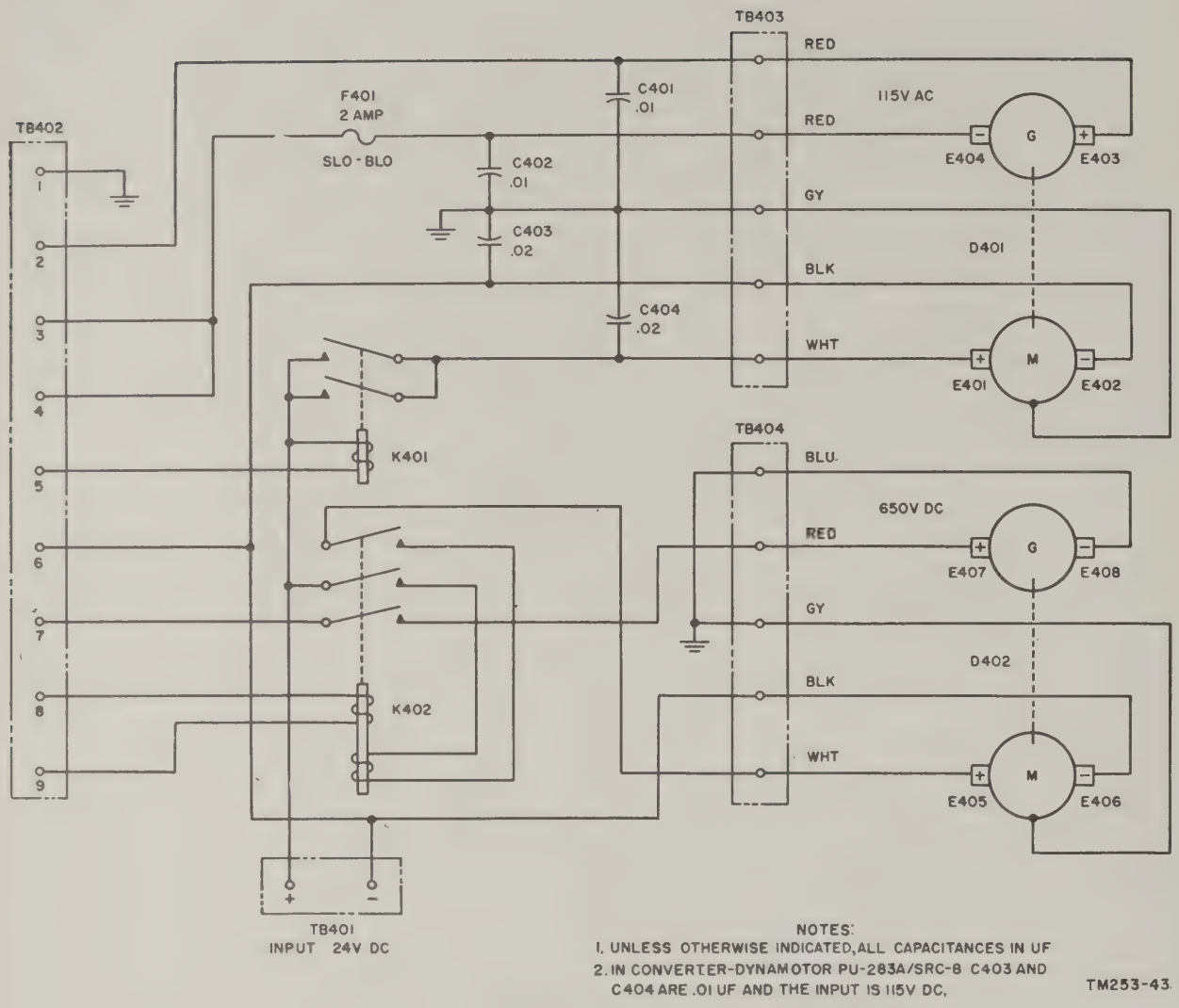


Figure 35. Converter-dynamotor unit, schematic diagram.

POWER switch to ON. The pilot lamp on the receiver-transmitter should light and the low-voltage dynamotor or inverter ((1) above) should turn on.

(3) Set the OUTPUT switch on the remote control unit to SPEAKER. Turn the VOLUME control clockwise until the receiver background noise is heard in the speaker.

Note. The VOLUME control on the receiver is in the audio output stage. Therefore, the VOLUME control on the receiver-transmitter must be turned up for signals to be heard in the remote control unit.

(4) Turn the OUTPUT switch on the remote control unit to PHONE. The receiver background noise should be heard in the earpiece of the handset. Return the OUTPUT switch to the SPEAKER position.

(5) At the receiver-transmitter turn the OUTPUT switch to the PAGE position. Speak into the mouthpiece of the handset. Your voice should be heard through the speaker of the remote control unit.

c. The following steps cover the operational tests for the transmitter section after the receiver checks have been completed.

(1) Turn the Channel selector switch to any channel in which crystals have been installed.

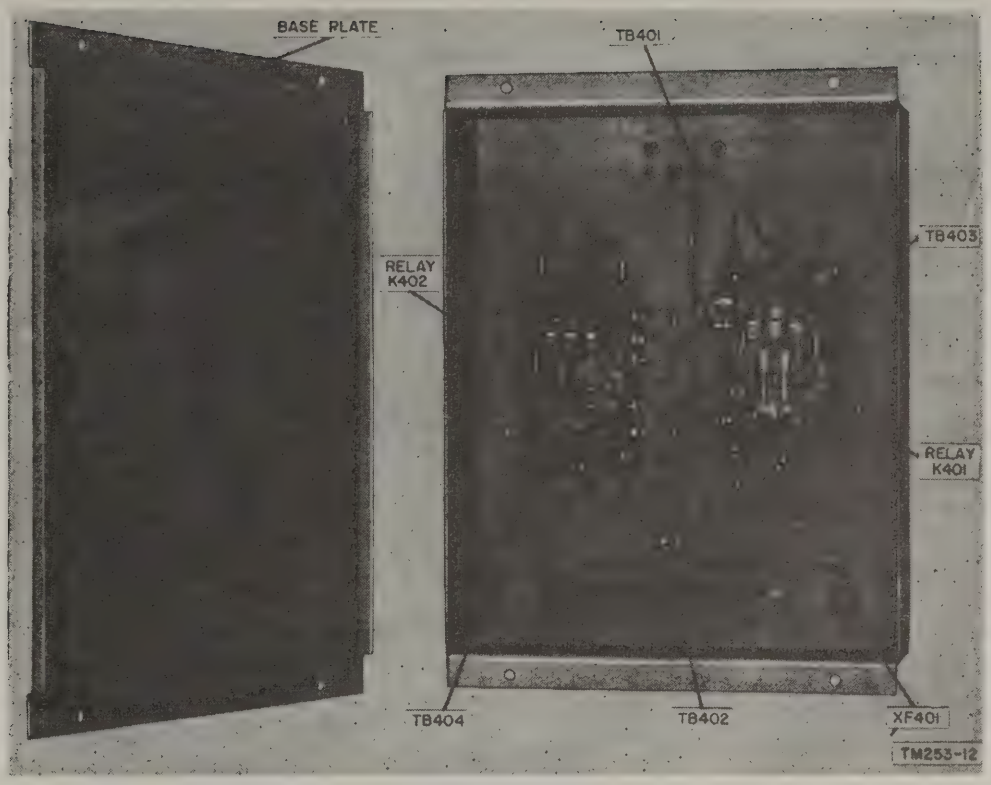


Figure 86. Converter-dynamotor, bottom view.

(2) Set Multimeter TS–352/U to 0- to 500-ma scale.

(3) Remove the two thumbscrews on the top of the receiver-transmitter cabinet and pull the cabinet forward exposing the rear of the chassis.

(4) Bring the test leads from the multimeter through the access holes in the bottom or rear of the cabinet and insert them in PA CATH test jacks J101 and J102. Observe polarity. Close the cabinet being certain that the test leads do not interfere with closing.

(5) Press the push-to-talk button on the handset and observe the current on the multimeter. The current should be not less than 180 or more than 220 milliamperes.

(6) Turn the channel selector switch to all other channels which have crystals installed and repeat the procedure in (5) above for each channel selected.

(7) Open the cabinet and remove the multimeter test leads from the PA CATH test jacks and insert them in PA GRID test jacks J103 and J104. Set the multimeter on the 10-ma scale. Observe polarity. Close the cabinet.

(8) Press the push-to-talk button on the handset and observe the current on the multimeter. The current should be not less than 7 milliamperes.

(9) Turn the channel selector switch to all other channels in which crystals are installed. Repeat the procedure in (8) above for each channel selected. If all channels are low, replace the 6J5 oscillator tube, otherwise replace the crystal for the channel which is low.

(10) Open the cabinet and remove the multimeter test leads from the PA GRID test jacks. Set the multimeter to 500-ma scale. Insert the test leads into MOD CATH test jacks J105 and J106. Observe polarity. Close the cabinet.

(11) Press the push-to-talk button on the handset; the current on the multimeter should be approximately 80 ma. A prolonged whistle into the handset microphone should increase the current to approximately 150 ma. If current is low, replace 807 modulator tubes.

Step No.	Procedure	When to perform	What to expect	What to do next when results are—	
				Normal	Abnormal
2	Perform transmitter test procedure, in paragraph 66c (1) through (3) and (7) through (9).	When abnormal results are obtained at step 1.	PA GRID current not less than 7 ma.	Step 9.	If there is no PA GRID current or it is abnormally low, perform step 6.
3	Perform transmitter test procedure, paragraph 66c (1) through (3) and (10).	When normal results are obtained at step 2.	MOD CATH current between 80 and 100 ma.	Step 4.	If MOD CATH current is above normal, perform step 11. (See *Caution a* above). If MOD CATH current is below normal, perform step 5.
4	Whistle into handset microphone.	When MOD CATH no-signal current is normal in step 3.	MOD CATH current increases to approximately 150 ma.	Step 10.	Check handset, switch S103B and T101 primary for short or open circuit.
5*a*	Use the vtvm to meter the voltages at J201. (Radio Sets AN/SRC–8 and AN/SRC–8AZ).	*a.* When PA CATH current at step 1 is below normal or *b.* When MOD CATH current at step 3 is below normal.	Between terminals 1 and 7: 650 volts dc; 1 and 8: 110 volts dc; 1 and 9: 0 volts dc.	If PATH CATH current is below normal and power supply readings are normal, perform step 10. If MOD CATH current is below normal and the readings at J201 are normal, perform step 11.	Check the power distribution circuits of converter-dynamotor, and interconnecting power cable
5*b*	On Radio Set AN/SRC–8XX, check with vtvm at red terminal from D302 at TB301 (figs. 34 and 44).	*a.* When PA CATH current at step 1 is below normal or *b.* When MOD CATH current at step 3 is below normal.	650 volts dc.	If PA CATH current is below normal and power supply readings are normal, perform step 10. If MOD CATH current is below normal and the readings at J201 are normal, perform step 11.	Check dynamotor and control circuits.
6	Remove the pa plate caps and connect Signal Generator AN/URM–25 output through .05 μf capacitor to pin 5 of buffer amplifier V102. Use an input voltage of .2 volts.	When PA GRID current at step 2 is below normal.	1 ma PA GRID current.	Step 7.	Take voltage resistance measurements of stage V102 to isolate defective component.
7	Set channel selector to unused channel or remove crystal from socket. Remove the pa plate caps and connect the signal generator through a .05 μf capacitor to pin 5 of V101.	When abnormal reading is obtained at the grid, pin 5, of the crystal oscillator V101.	5 ma PA GRID current.	Substitute crystal with one known to be in good operating condition and of proper frequency. Check crystal selecting switches S101A and B.	Perform step 8.
8	Use vtvm to measure voltages at crystal oscillator V101.	When abnormal results are obtained in step 7.	The voltages indicated on voltage-resistance chart (figs. 31 and 32).		Replace component found to be defective.

Step No.	Procedure	When to perform	What to expect	What to do next when results are—	
				Normal	Abnormal
9	Use the vtvm to meter the voltages at V103 and V104.	When PA GRID current at step 2 is normal.	The voltages indicated in voltage resistance chart (figs. 31 and 32).	Check pa tank circuit and antenna for short circuits. *Note.* Use visual inspection to see that the adjustable tap clips on L106 and L107 are not shorting together.	Take resistance measurements of stages V103 and V104 to isolate defective component.
10	Use the vtvm to check for open and high resistance circuits in the antenna tuning and antenna circuit.	When normal results are obtained at step 4. When PA CATH current at step 5 is below normal.	Very low resistance readings through antenna circuit coils. Infinite resistance between coils.		Check for corroded contacts in antenna lead-in and antenna; high resistance in relay contacts; open or corroded switch contacts; open coil windings.
12	Use the vtvm to measure the voltages at V105 and V106.	When MOD CATH current at step 3 is above normal. When MOD CATH current at step 5 is below normal.	Correct voltages.		Take resistance measurements of stages V105 and V106 to isolate defective component. (figs. 31 and 32).

69. Resistances of Transformers and Coils

The dc resistances of the transformer winding and the coils in the receiver-transmitter are listed below:

Transformer or coil	Terminal identification	Resistance
T201 (Radio Receiver-Transmitter RT-306A/SRC-8 only).	1–2	11
	3–4	.5
	5–6	100
	5–7	200
T202 (Radio Receiver-Transmitter RT-306A/SRC-8.	1–2	5
	3–5	Less than 1
T101	Blue to red-blue	12
	Black to green	3,500
	Black to other green	4,000
	Green to green	7,500
T102	1–2	105
	2–3	100
	4–5	45
T103	Green to black	1
	Blue to red-blue	120
Z101	Black to green	1.5
	Red to blue	2
Z102	Black to green	1.5
	Blue to red	7.25
Z103	A–C	13
	D–F	13
Z104	A–C	13
	D–F	13
Z105	A–C	12
	D–F	12
L101, L102, L104		32
L103		2.8
L105		6
L108		9
L110		230
L201 (Radio Receiver-Transmitter RT-306A/SRC-8 only).		230
L301, 302, L303 (Radio Receiver-Transmitter RT-327A/SRC-8XX only).		Less than 1
L304, L305 (Radio Receiver-Transmitter RT-327A/SRC-8XX only).		32

Section II. REPAIRS

70. Replacement of Parts

All components in the receiver-transmitter and the converter-dynamotor are easily replaced. Refer to figures 2, 5, 6, 33, 34, 36, 37, 38 and the wiring diagrams (figs. 43 and 44) to locate the components. Careless replacement of parts usually creates new faults. Observe the following precautions and techniques:

a. Before a part is unsoldered, note the position of the leads. If the part has a number of connections, tag each of the leads.

b. When a part is replaced in the RF or IF circuits, it must be placed in the exact position occupied by the old part. A part that has the same electrical value but different physical size may cause trouble in high-frequency circuits. Give particular attention to proper grounding. Use the same ground as in the original wiring. Failure to observe these precautions may result in decreased gain or in oscillation.

c. If variable capacitors C110 or C111 must be replaced, the transmitter section must be realined. This alinement can be kept to a minimum by setting the rotor of the replacement capacitor as nearly as possible in the same position as in the component being replaced. Refer to par. 17 for the alinement procedure.

d. If inductors L106 or L107 must be replaced, the transmitter must be realined. This alinement can be kept to a minimum by noting the turns on which the various taps are connected and placing them on the same turns of the replacement inductor. Refer to paragraph 17 for the alinement procedure.

e. If intermediate frequency transformer assemblies Z103, Z104, or Z105 are replaced, the IF section of the receiver must be alined. Refer to paragraph 73 for the alinement procedure.

f. If RF transformer assemblies Z101 or Z102 are replaced, the RF section of the receiver must be alined. Refer to paragraph 74 for the alinement procedure.

g. If any of the ten capacitor assemblies C116 or the ten capacitor assemblies C123 are replaced, the RF section of the receiver must be realined for that channel. Refer to paragraph 74 for the alinement procedure.

71. Disassembly of Equipment

a. Removal of Receiver-Transmitter Chassis From its Cabinet.

(1) Remove the four slotted-head screws from the front panel and remove the panel.

(2) Remove the single slotted-head sheet metal screw that holds the grounding strap to the cabinet.

(3) Disengage the two knurled thumbscrews from the top of the cabinet.

(4) Open the cabinet by pulling the top of the cabinet forward.

(5) Remove the cable to the converter-dynamotor by pulling the plug from receptacle J201 located at the bottom of the chassis. In Radio Set AN/SRC–8XX disconnect the power supply cables at the primary power source.

(6) Remove the ground connection from the ground terminal located at the bottom of the chassis.

(7) Disconnect the local handset by loosening the four terminal screws at TB101 (fig. 37) and removing the spade-lugged leads. Remove the nut and washer that hold the strain relief clip which is attached to the handset cable.

(8) Remove the antenna lead from the antenna post by loosening the nut that is located inside the cabinet.

(9) Disconnect the remote cable leads from TB102 by loosening the seven terminal screws and removing the spade lugs.

(10) Remove the eight stop nuts located on the front channel, four on each side, by holding the slotted-head screws that are assembled through the eight shock mounts which hold the chassis in the cabinet.

(11) Lift the chassis out.

b. Disassembly of Converter-Dynamotor (figs. 2 and 36):

(1) To disassemble the cover from the chassis, remove the six No. 6 self-tapping screws that hold it to the chassis. There are three on each end.

(2) To disassemble the bottom plate from the chassis, remove the two No. 6 self-tapping screws that hold it to the chassis. There is one on each side.

(3) To remove either converter D401 or dynamotor D402, first loosen the five screw terminals on the proper terminal board and remove the dynamotor or converter leads. These leads are terminated with spade lugs. Do not remove the screws from the screw terminals. Remove the stop nuts from the screws that are assembled through the shock mounts located in the mounting base of the dynamotor or converter. Lift the unit off the chassis. Be careful not to damage the insulating grommets.

c. Removal of Dynamotor From Radio Receiver-Transmitter RT–327A/SRC–8XX Chassis (figs. 6 and 34). To remove either dynamotor D301, or dynamotor D302, first loosen the five screw terminals on terminal board TB301 and remove the dynamotor leads. These leads are terminated with spade lugs. Do not remove the screws from the screw terminals. Remove the stop nuts from the screws that are assembled through the vibration isolators located in the mounting base of the dynamotors. Lift the unit off the chassis. Be careful not to destroy the insulating grommets.

Section III. ALINEMENT PROCEDURES

72. Test Equipment Required for Alinement

For alinement purposes, the following test equipment and components are required. A common name is indicated for each of the test equipments.

Equipment or component	Common name
Signal Generator AN/URM–25	Signal generator
Electronic Multimeter TS–505/U	vtvm
.05 μf capacitor	
200 μμf capacitor	

73. Receiver IF Alinement Procedures

a. Turn the POWER switch to ON and allow 15 minutes for the receiver to warm up. Set the channel selector switch to a blank position or remove the receiver crystal from the channel being used.

b. Connect the vtvm to the avc line, pin 3 of V111 and ground.

c. Set the panel controls as indicated:

Control	Setting
SQUELCH control	OFF
VOLUME control	Middle of range
OUTPUT switch	SPKR position

d. Connect the signal generator to the grid cap of converter V108 through a .05 μf capacitor.

e. Tune the signal generator to 456 kc and modulate the signal 30 percent with a 400-cycle tone.

f. Increase the output of the signal generator until the 400-cycle tone is heard in the speaker and an indication is seen on the vtvm.

g. With a small screwdriver rotate the two slug tuning adjustments at top and bottom of IF transformer Z105 for maximum indication on the vtvm. Reduce the output of the signal generator as the transformer is peaked and maintain an avc voltage of approximately −1.5 volts.

h. Repeat the adjustment described in *g* above for IF transformers Z104 and Z103.

i. When the transformers are all alined, go over all transformer adjustments for a final peaking.

74. Receiver RF Alinement Procedure

With the controls set (par. 73), and the vtvm connected as directed for IF alinement, connect the RF signal generator in series with a 200-μμf capacitor to the antenna post.

a. Set the channel selector switch to channel 1 (extreme counterclockwise direction).

b. The oscillator of the receiver is crystal-controlled and therefore requires no tuning. Check the frequency marked on the oscillator crystal and subtract the IF frequency, 456 kc, from that frequency. This gives the receiving frequency of the channel. For example, if the crystal frequency is 2,456 kc, the receiving frequency is 2,000 kc.

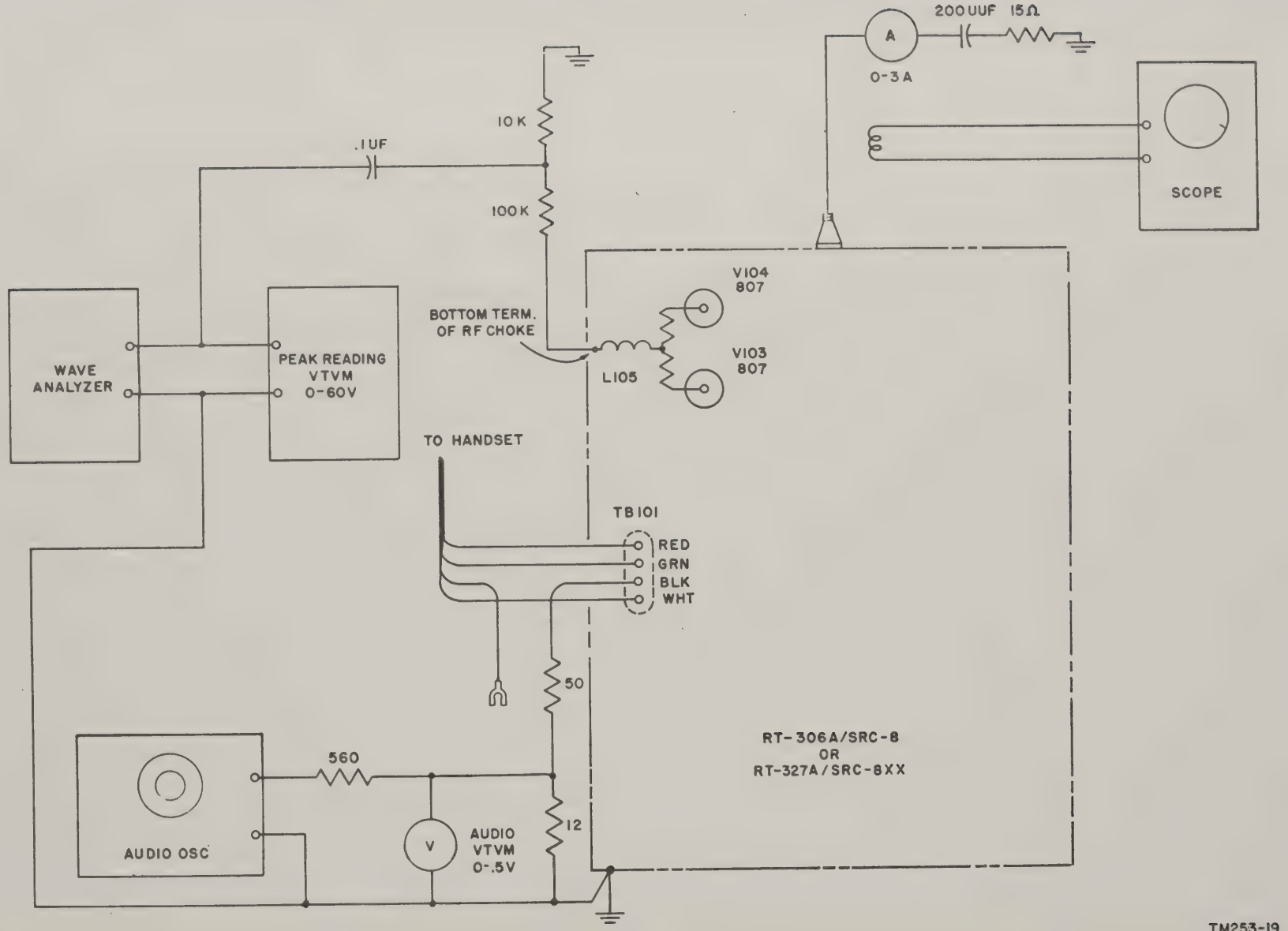


Figure 39. Setup for final testing the transmitter section.

(8) Repeat (5) through (7) above for receiver frequencies of 2,000 and 3,500 kc.

79. Final Testing Transmitter Section

Caution: The transmitter section of the receiver-transmitter is designed for intermittent duty. Prolonged operation can be detrimental to the equipment.

a. Setup.

(1) Connect the transmitter to the test equipment as shown in figure 39.

(2) Set the controls of the receiver-transmitter in accordance with the chart below.

Note. All measurements should be taken with a pa cathode current of 200 ma. Measure this in accordance with instructions in paragraph 66*c*.

Control	Setting
POWER	ON
SQUELCH	OFF
VOLUME	Fully counterclockwise
OUTPUT	SPKR
Channel Selector	2,738 kc channel

b. Audio Frequency Response.

(1) Set the audio oscillator frequency to 1,000 cycles.

(2) Energize the transmitter and increase the output of the audio oscillator until 50 percent modulation is obtained. Use a peak-to-trough ratio of 3:1 as viewed on the oscilloscope.

(3) Read and note the audio oscillator output and the modulator voltage as indicated on the peak reading vtvm.

(4) Hold the output of the audio oscillator constant and run a response curve. The results should correspond to within 10 percent of the values shown in figure 40.

c. Modulation Limiting.

(1) Increase the output level of the audio oscillator 16 db (6.3 times the output required for the test in *b* above).

(2) With the coupling link (fig. 39) connected to the vertical input of the scope, the modulation as viewed on the scope should not exceed 100 percent. One hundred percent modulation is indicated by the troughs of the modulation envelope just meeting at the horizontal axis of the scope pattern.

d. Modulation Distortion.

(1) Set the audio oscillator frequency to 400 cycles and modulate the transmitter 75 percent as indicated on the oscilloscope.

(2) Check the percent of harmonic distortion on the wave analyzer. The harmonic distortion should not exceed 10 percent.

e. Power Output.

(1) With the transmitter adjusted for a pa cathode current of 200 ma the RF antenna current should be at least 1.82 amperes.

(2) Repeat (1) above for transmitter frequencies of 2,000 and 3,500 kc.

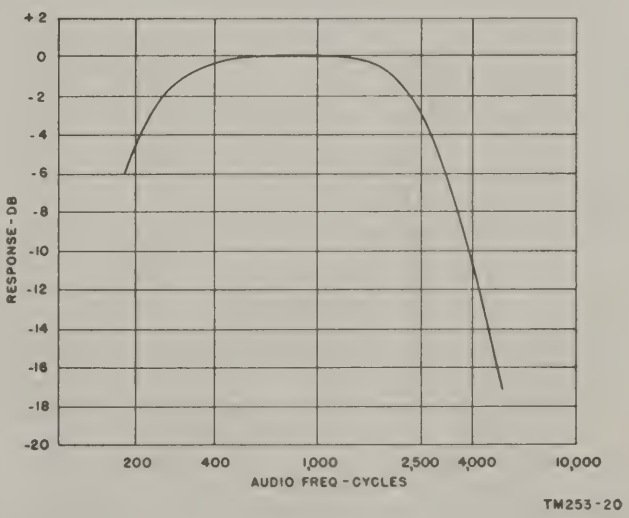


Figure 40. Radio receiver-transmitter, audio frequency response curve.

CHAPTER 8

SHIPMENT AND LIMITED STORAGE AND DEMOLITION TO PREVENT ENEMY USE

Section I. SHIPMENT AND LIMITED STORAGE

80. Disassembly for Shipment and Storage

The following instructions are recommended as a guide for preparing the radio set for transportation and storage.

Caution: Before proceeding with disassembly of this equipment, disconnect power cables from the power supply or open the master switch to the equipment.

a. Converter-Dynamotor.

(1) Disconnect the power supply line at input terminal board TB401 (fig. 2).

(2) Disconnect Electrical Special Purpose Cable Assembly CX–3761/SRC–8 at terminal board TB402.

(3) Replace and fasten the cover.

(4) Remove the converter-dynamotor from the mounting facility.

b. Receiver-Transmitter.

(1) Loosen the knurled screws at top rear of cabinet and open the unit.

(2) Disconnect the antenna lead at the antenna post.

(3) Disconnect Electrical Special Purpose Cable Assembly CX–3761/SRC–8 (Radio Sets AN/SRC–8 and AN/SRC–8AZ only), and pull the free end through the panel. Remove cable from inside of receiver-transmitter.

(4) In Radio Set AN/SRC–8XX, disconnect the power leads.

(5) Unfasten the mounting bolts or screws at the bottom and/or rear panels.

(6) Close the unit and fasten with the knurled screws.

Note. Separate instructions will be issued regarding removal of channel crystals when required.

81. Repacking for Shipment or Limited Storage

The exact procedure for repacking depends on the material available and the conditions under which the equipment is to be shipped or stored. Use the procedures outlined below whenever possible.

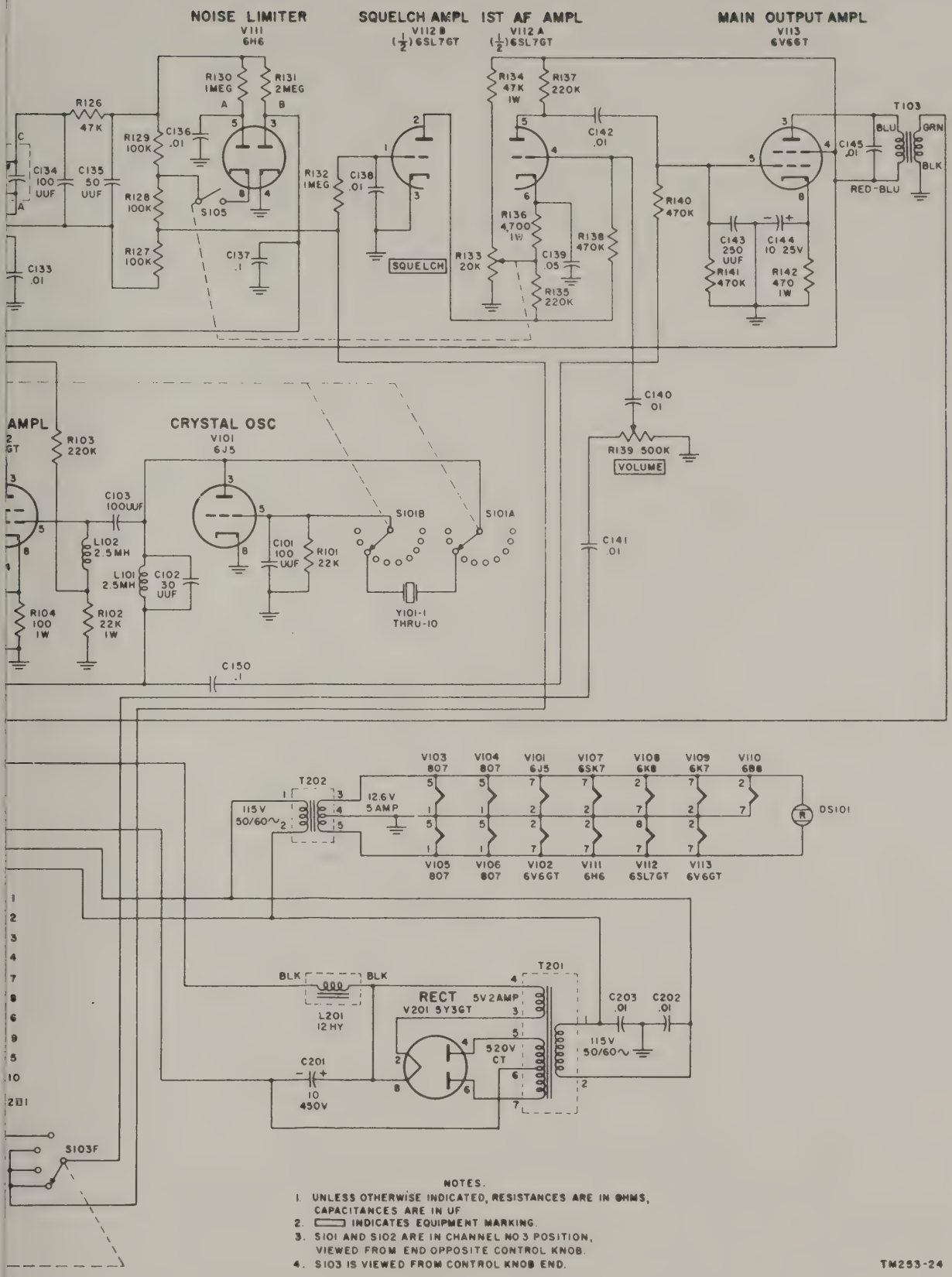
a. Material Requirements.

(1) The following materials are required for packaging the radio sets:

Material	Quantity	
	Radio Sets AN/SRC–8 or AN/SRC–8AZ	Radio Set AN/SRC–8XX
Single-faced corrugated paper	130 sq ft	124 sq ft
Waterproof barrier material	90 sq ft	86 sq ft
Gummed paper tape	30 ft	30 ft
Pressure-sensitive tape	20 ft	20 ft
Flat steel strapping	40 ft	38 ft
Cotton twine	8 ft	8 ft

(2) Detailed dimensional data for the two wooden boxes are as follows:

Contents of box	Box size (in.)	Board ft	Cubic ft	Packed weight
Radio Set AN/SRC–8 or AN/SRC–8AZ	28 x 24 x 27	40	10.5	188 lb
Radio Set AN/SRC–8XX	24 x 24 x 19	35	7	125 lb



NOTES.

1. UNLESS OTHERWISE INDICATED, RESISTANCES ARE IN OHMS, CAPACITANCES ARE IN UF
2. ▭ INDICATES EQUIPMENT MARKING.
3. S101 AND S102 ARE IN CHANNEL NO 3 POSITION, VIEWED FROM END OPPOSITE CONTROL KNOB.
4. S103 IS VIEWED FROM CONTROL KNOB END.

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schematic diagram.

CHAPTER 8

SHIPMENT AND LIMITED STORAGE AND DEMOLITION TO PREVENT ENEMY USE

Section I. SHIPMENT AND LIMITED STORAGE

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(3) Replace and fasten the cover.

(4) Remove the converter-dynamotor from the mounting facility.

b. Receiver-Transmitter.

(1) Loosen the knurled screws at top rear of cabinet and open the unit.

(2) Disconnect the antenna lead at the antenna post.

(3) Disconnect Electrical Special Purpose Cable Assembly CX–3761/SRC–8 (Radio Sets AN/SRC–8 and AN/SRC–8AZ only), and pull the free end through the panel. Remove cable from inside of receiver-transmitter.

(4) In Radio Set AN/SRC–8XX, disconnect the power leads.

(5) Unfasten the mounting bolts or screws at the bottom and/or rear panels.

(6) Close the unit and fasten with the knurled screws.

Note. Separate instructions will be issued regarding removal of channel crystals when required.

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	Radio Sets AN/SRC–8 or AN/SRC–8AZ	Radio Set AN/SRC–8XX
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Waterproof barrier material	90 sq ft	86 sq ft
Gummed paper tape	30 ft	30 ft
Pressure-sensitive tape	20 ft	20 ft
Flat steel strapping	40 ft	38 ft
Cotton twine	8 ft	8 ft

(2) Detailed dimensional data for the two wooden boxes are as follows:

Contents of box	Box size (in.)	Board ft	Cubic ft	Packed weight
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Radio Set AN/SRC–8XX	24 x 24 x 19	35	7	125 lb

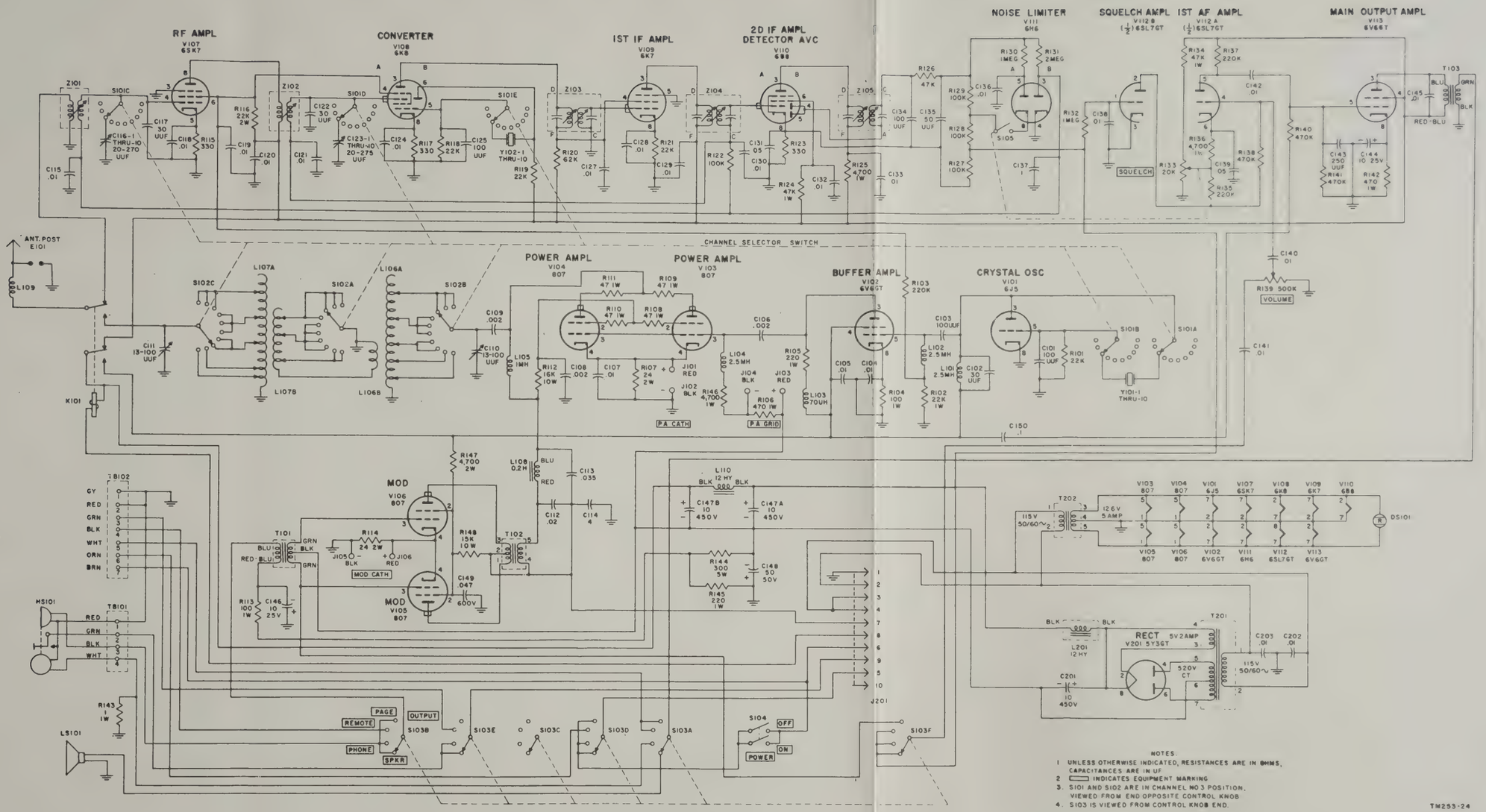

Figure 41. Radio Receiver-Transmitter RT–306A/SRC–8 schematic diagram.

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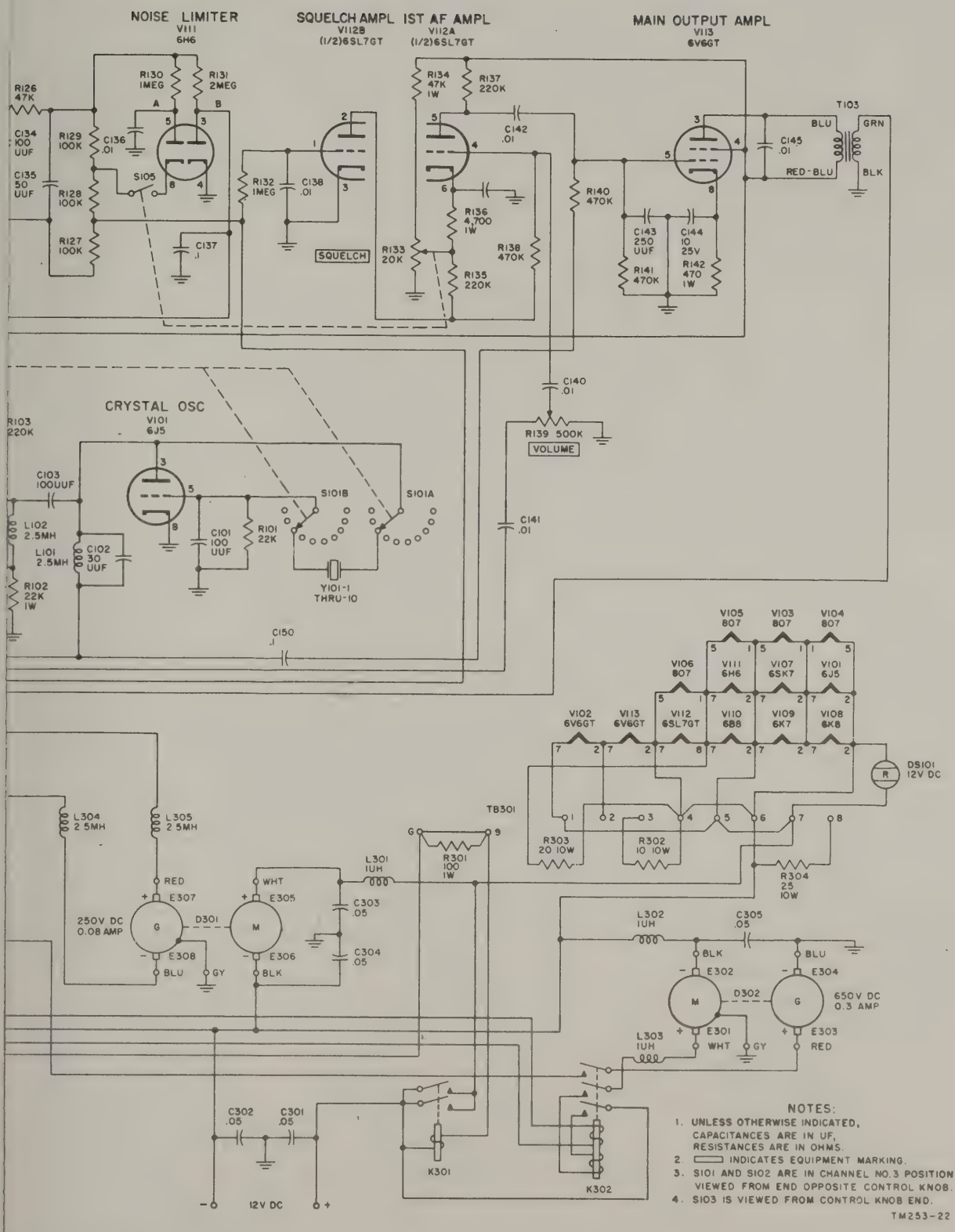

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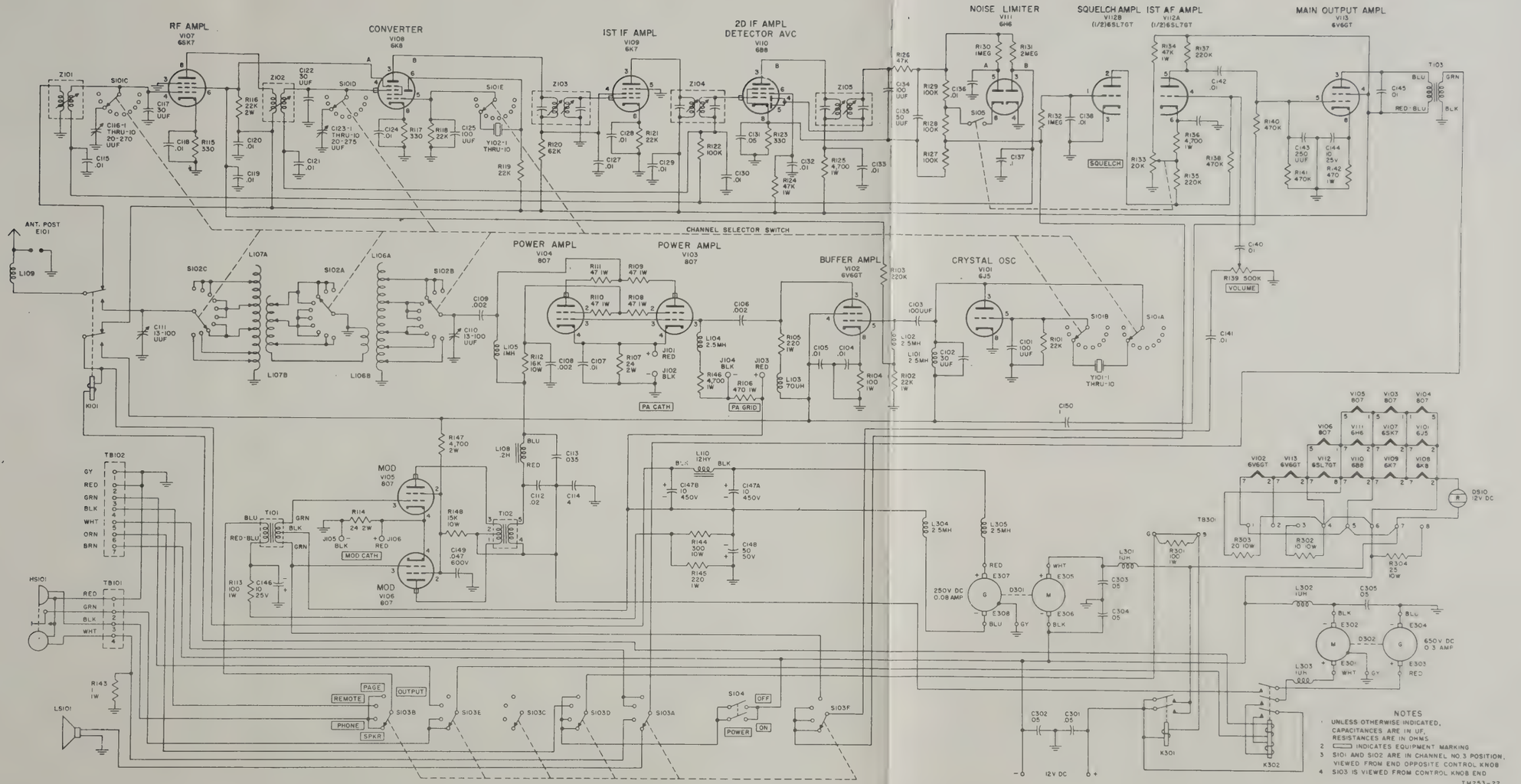
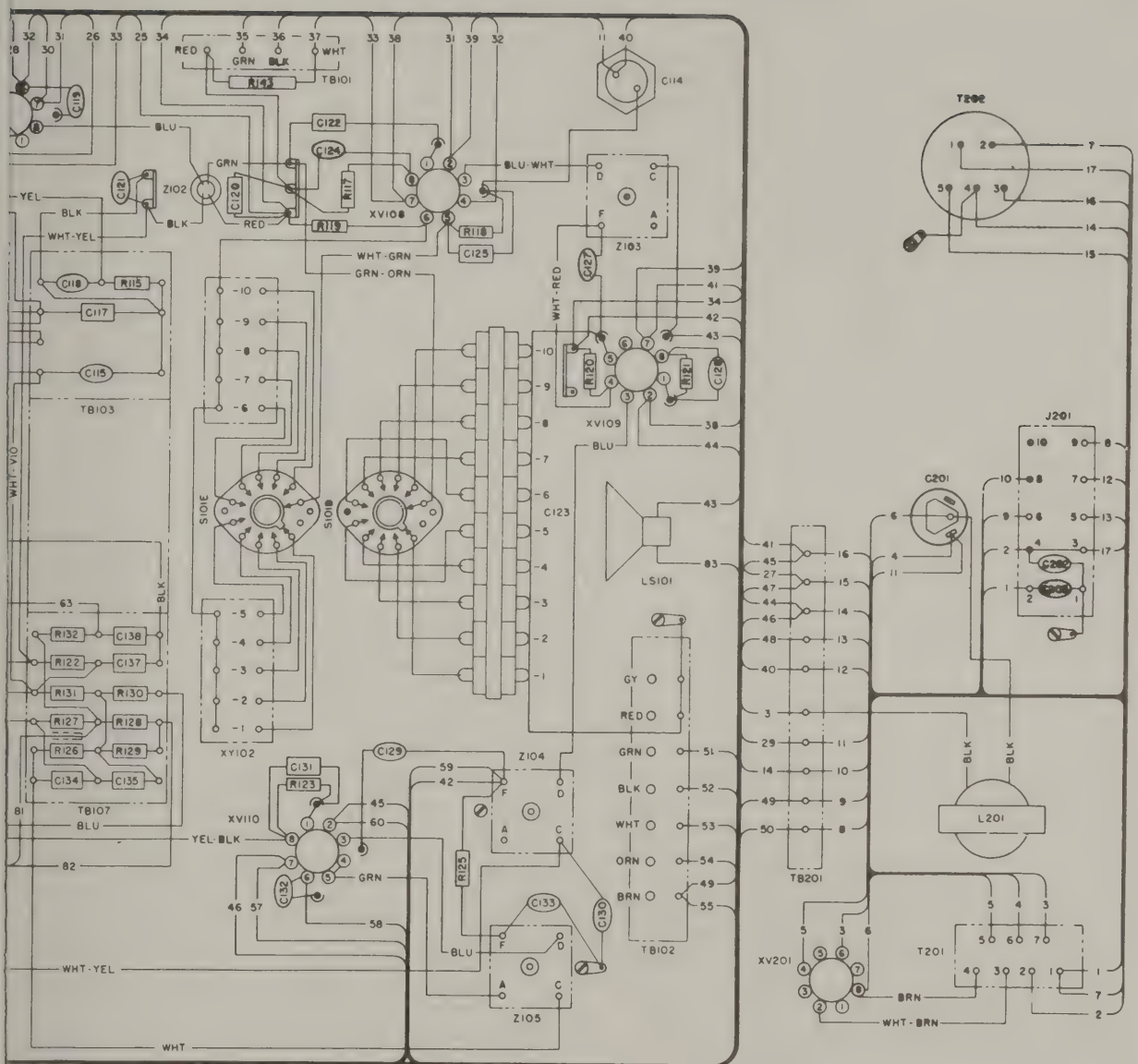


Figure 42. Radio Receiver-Transmitter RT-327A/SRC-8XX, schematic diagram.



NOTE:

THE GRID CAP OF V108 CONNECTS BY A GRN LEAD TO THE TOP OF RF TRANSFORMER Z102, V109 TO Z103 & V110 TO Z104

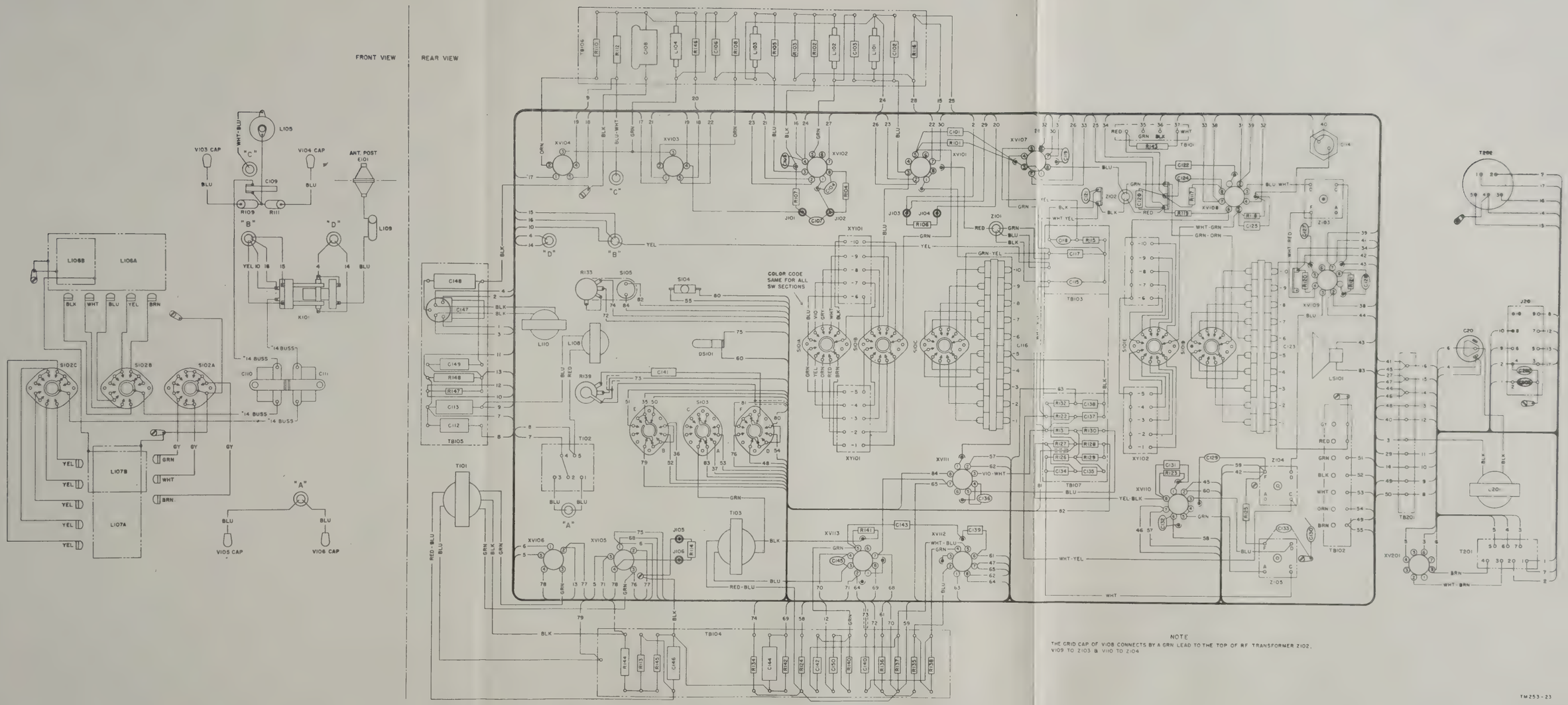


Figure 43. Radio Receiver-Transmitter RT-306A/SRC-8, wiring diagram.

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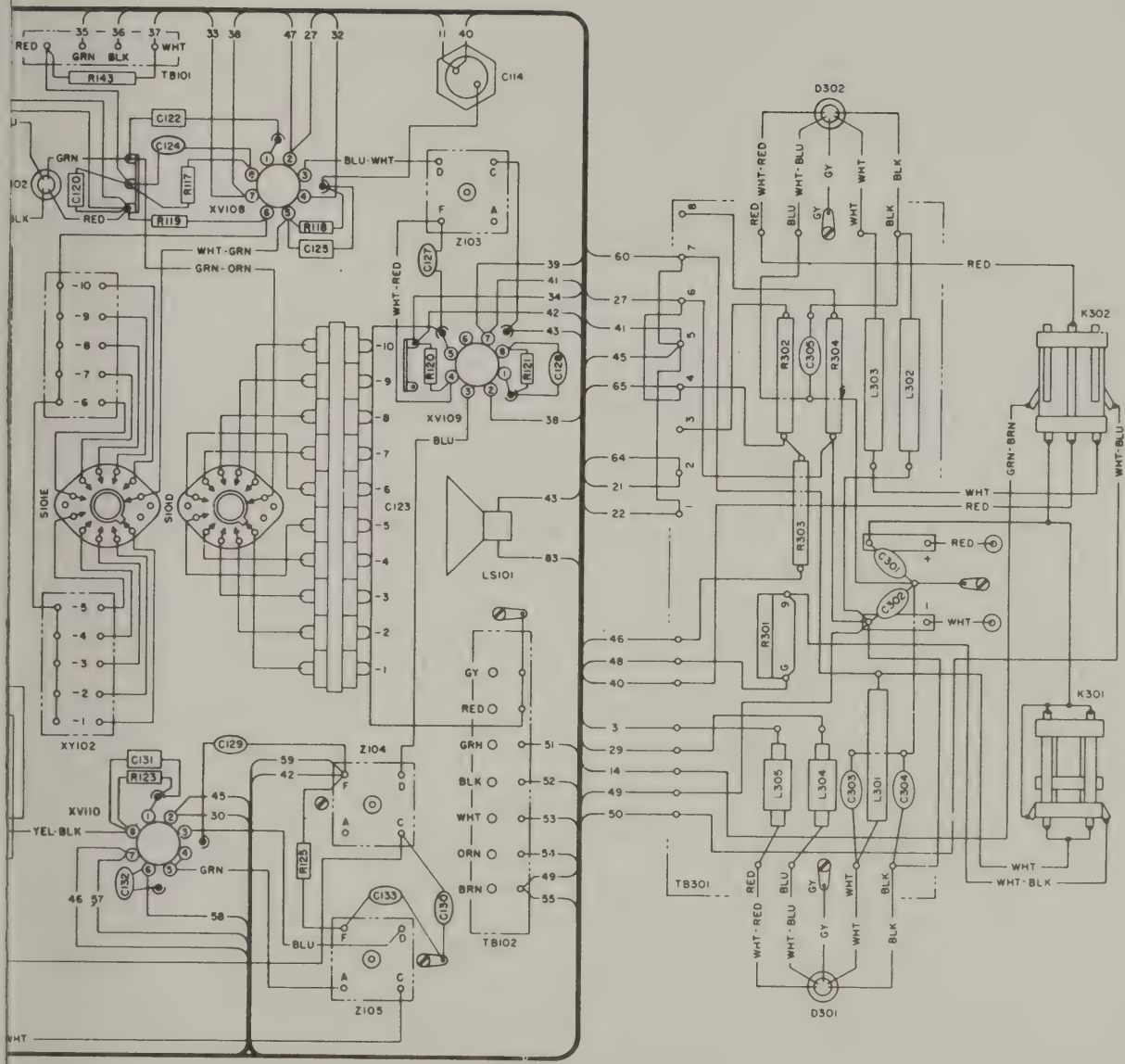

NOTE:

08 CONNECTS BY A GRN LEAD TO THE TOP OF RF TRANSFORMER Z102,
0 TO Z104

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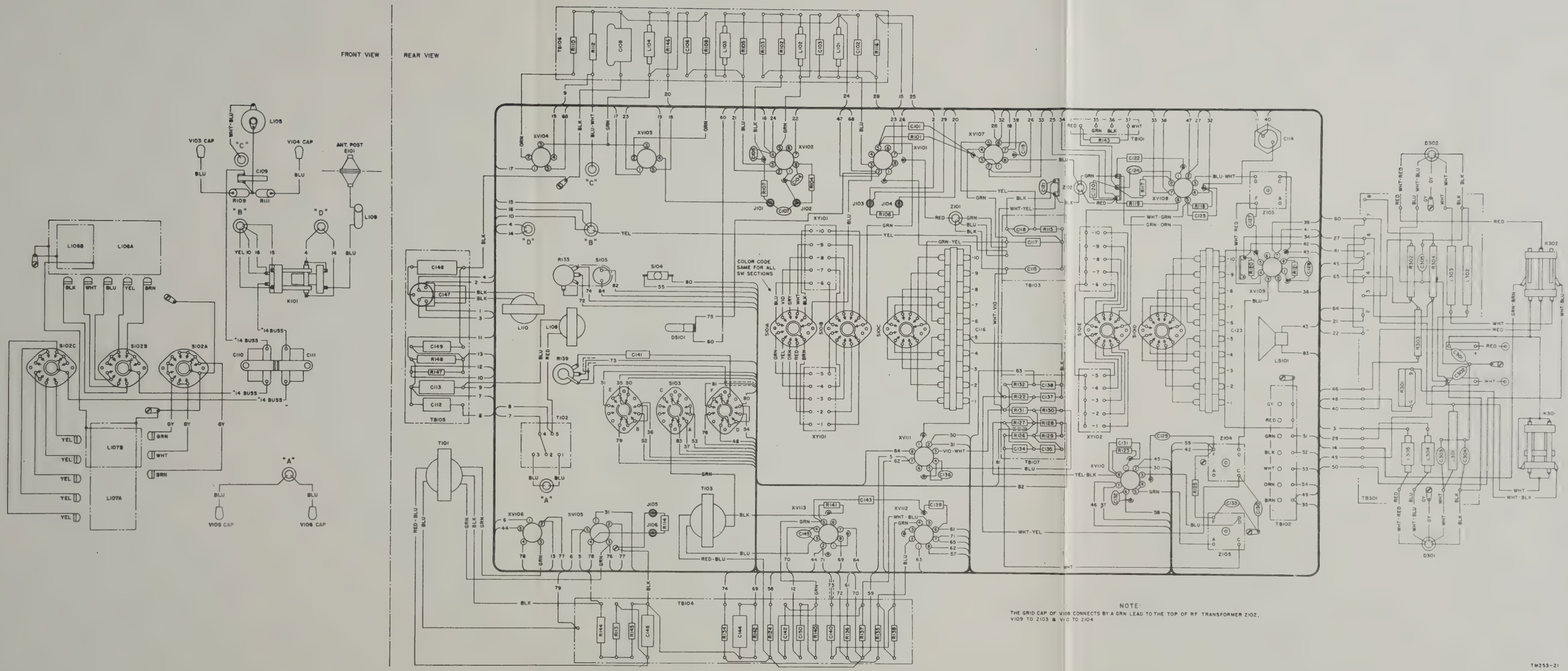

Figure 44. Radio Receiver-Transmitter RT-327A/ARC-8XX, wiring diagram.

b. Packaging. Package the items of the radio set as outlined below.

(1) *Receiver-transmitter.* Cushion the receiver-transmitter on all surfaces with pads fabricated of flexible single-faced corrugated paper. Place the cushioned unit within a wrap of flexible single-faced corrugated paper. Secure the wrap with gummed paper tape.

(2) *Spare parts and miscellaneous components.* Spare tubes, spare brushes, and other spares used in the receiver-transmitter should be packed as a unit. Both the used and the spare power cable assembly should be coiled carefully, tied with cotton twine, and have both ends masked. The auxiliary and accessory components (not a part of the radio set) may be packaged separately.

c. Packing. Pack the consolidated packages in the nailed wooden box. Stow the contents snugly in the wooden box after lining the inside with a waterproof case liner. Insert the consolidated packages and fill voids in the box with pads of flexible corrugated paper. Use metal strapping around boxes intended for intertheater shipment.

Section II. DEMOLITION OF MATERIEL TO PREVENT ENEMY USE

82. Authority for Demolition

Demolition of the equipment will be accomplished only upon the order of the commander. The destruction procedures outlined in paragraph 83 will be used to prevent the enemy from using or salvaging the equipment.

83. Methods of Destruction

The quickest and most efficient method of destroying the equipment is to jettison it. However any or all of the following methods may also be used to destroy the equipment if there is no time to unbolt the radio set from the shelf or bulkhead.

a. Smash. Smash the controls, antenna, tubes, coils, and crystals; use axes, handaxes, hammers, crowbars, or heavy tools.

b. Cut. Cut the output and power cord; use axes or handaxes.

c. Burn. Burn cords, wiring, and technical manuals; use gasoline, kerosene, oil, flame throwers, or incendiary grenades.

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[AG 413.44 (26 Apr 57)]

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WRAMC
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11–7
11–16
11–57
11–127
11–128
11–500
11–557
11–587
11–592
11–597

NG: State AG; units—same as Active Army.

USAR: None.

For explanation of abbreviations used, see SR 320–50–1.